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FOREST FLORA

OF

BRITISH BURMA.

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BY

S. KURZ,

CURATOR OF THE HERBARIUM, ROYAL BOTANICAL GARDENS, CALCUTTA.

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VOL. II.

(*Caprifoliaceæ*

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FOREST FLORA OF BRITISH BURMA.

CAPRIFOLIACEÆ.

Flowers regular or almost irregular. Calyx-tube adnate to the ovary, the limb truncate or 4-5- or more-lobed or -toothed. Corolla gamopetalous, tubular, funnel-shaped or rotate, inserted round the epigynous fleshy disk, 4- or 5- or rarely 3-lobed, imbricate. Stamens as many as corolla-lobes and alternating with them, inserted in the tube; anthers versatile, the cells parallel, opening longitudinally. Ovary inferior, 2-5- rarely 1-celled, with 1 or more pendulous ovules in each cell; stigmas as many as ovary-cells or united into one, sessile, or on a filiform simple style. Fruit an indehiscent berry or rarely a dry, dehiscing capsule, nude or crowned by the calyx-limb, 1-5-celled. Seeds solitary or several in each cell, the testa crustaceous or bony, rarely membranous. Albumen fleshy. Embryo axial; radicle superior; cotyledons oval or oblong.—Trees or shrubs, sometimes climbing, rarely herbs, with opposite, simple or pinnate leaves. Stipules usually none. Flowers small or middling-sized, variously arranged, but usually cymose.

A small order of hardly any interest to the forester. The honeysuckles are celebrated for their fragrance and beauty. Medicinal properties exist in the elders and some other genera. All Burmese species are woody plants.

* *Corolla regular, rotate or shortly tubular. Stigmas* 3, *on a very short style.*

Berry by abortion 1-celled and 1-seeded; leaves simple . . *Viburnum.*

Berry with 3-5 pyrenes; leaves unpaired-pinnate or pinnatisect . *Sambucus.*

* * *Corolla-tube more or less elongate, the limb often irregular. Style filiform.*

Corolla tubular; ovary and berry 2-3-celled, the latter few- or many-seeded . . . . . *Lonicera.*

Corolla tubular funnel-shaped, regular; ovary 2-celled, with a parietal 2-ovuled placenta protruding into the cells so as to form a spuriously 4-celled ovary; fruit a drupe . . . *Scyphiphora.*

VIBURNUM.

Calyx-tube ovate or turbinate, the limb persistent, 5- rarely 4-cleft. Corolla rotate or shortly funnel-shaped, regular, spreadingly 5- rarely 4-lobed. Stamens equal, 5 or 4. Ovary 1- rarely

entire on the inner face; flowers cymose or cymose-panicled; shrubs, rarely undershrubs, rarely climbers . . . . . *Psychotria.*

Corolla-tube elongate, naked at the throat; pyrenes with a furrow on the inner face along the central placenta; shrubs or undershrubs; inflorescence as in preceding . . . . *Chasalia.*

§ § Corolla-lobes imbricate or twisted; albumen usually bony.

† Ovule attached to the middle of the placenta.

Corolla salver-shaped, the limb 4-5-parted; flowers in terminal corymbs or panicles; stipules usually connate . . . *Ixora.*

Corolla funnel-shaped, glabrous, the limb 4-7-parted; berries 2- or rarely 1-seeded; seeds enclosed in chartaceous pyrenes; flowers terminal and axillary; stipules free . . . . . *Coffea.*

†† Ovules erect.

Corolla funnel-shaped, velvety, like the calyx often somewhat oblique; berries 1- rarely 2-pyrenous; flowers terminal and axillary; stipules free . . . . . *Serissa.*

++ Ovary 4-9-celled; drupes with as many pyrenes.

Calyx more or less toothed; styles and ovary-cells 4-9; erect shrubs, with axillary, clustered or cymose flowers . . . *Lasianthus.*

Calyx-limb truncate; style 2-cleft; ovary 4-celled; climbing shrubs with axillary clustered flowers . . . . . *Gynochthodes.*

○○ Ovary 1- or several-celled, with a solitary or rarely (*in Polyphragmon*) numerous ovules attached laterally or suspended at the middle or at the summit of each cell. Pyrenes hard and bony, either connate into a hard putamen or loosely arranged. Albumen usually fleshy.

+ Corolla-lobes valvate; ovules attached laterally or near the top.

Ovary usually 5-celled; stigma discoid . . . . . *Vangueria.*

Ovary 2-celled; drupe didymous or by abortion more or less 1-celled . . . . . *Plectronia.*

++ Corolla-lobes imbricate; ovules suspended from the summit of the normal or spurious cells.

§ Drupes containing a single several-celled putamen, the cells 1-seeded.

Ovary 4- or more-celled, with a solitary pendulous ovule in each cell; stigma thick, simple; drupes globular . . . *Guettarda.*

§ § Drupes berry-like, several-celled, each cell containing several or numerous collateral or superposed free, bony, 1-seeded spurious pyrenes.

Stigmatic styles as many as cells to the ovary . . . . *Polyphragmon.*

○○○ Ovary 1-celled, with parietal placentas, or more usually 2- or more-celled, with numerous ovules in each cell. Seeds free, not enclosed in pyrenes.

+ Ovary 1-celled, with 4-5 parietal placentas. Corolla-lobes imbricate.

Flowers usually showy; stigma entire, furrowed-twisted; berry large, the numerous seeds imbedded in pulp . . . *Gardenia.*

++ Ovary 2- or more-celled.

§ Corolla-lobes imbricate; ovary 2-celled.

† Flowers not in heads.

Stigma 2-lobed; style spindle-like thickened; berry large, the seeds imbedded in pulp; erect trees or shrubs . . . *Randia.*

Stigma simple or 2-lobed; style equally filiform; berry small, the seed without pulp; trees or shrubs, sometimes scandent and armed . . . . . *Webera.*

Style 2-cleft; berry rather large; seeds in double rows in each cell, without pulp; erect trees or shrubs . . . . . *Diplospora.*
Style 2-lobed, contracted in a stalk or sessile; seeds in a single row in each cell, without pulp; erect shrubs . . . . *Hypobathrum.*
Flowers polygamously dioecious; style 2-lobed; corolla funnel-shaped, glabrous; berry small, not pulpy, many-seeded . . *Brachytome.*

†† Flowers in peduncled heads.

Flowers dioecious; berry elongate and pod-like, free; ovules and seeds numerous in each cell, imbricate-suspended . . . *Morindopsis.*

§ § Corolla-lobes valvate or reduplicate-valvate; ovary usually 5-6 (rarely 2-3)-celled.

† Placentas simple; corolla-lobes valvate.

Calyx entire or minutely toothed; corolla-throat bearded; flowers in axillary clusters or cymes . . . . . *Urophyllum.*
Calyx 5-4-cleft; corolla-throat nude; ovary 5-celled; flowers in terminal or almost terminal, rarely lateral, cymes or corymbs . *Adenosacme.*
As preceding, but ovary 2-celled . . . . . *Myrioneuron.*

†† Placentas 2-cleft; corolla-lobes reduplicate-valvate; stigmas 2-5-lobed.

All calyx-teeth conform and not appendaged; connective of anthers produced in a mucro; herbs or perennials . . . *Acranthera.*
One or the other calyx-tooth of outer flowers produced into a large white-coloured leaf-like appendage; connective of anthers blunt; shrubs, often scandent, rarely small trees . . . *Mussaenda.*

* * *Fruit a more or less dry capsule variously dehiscing, or rarely indehiscent (very rarely turning fleshy or a true berry, the seeds in this case always winged or appendaged). Ovary 2- or several-celled, with one or several ovules in each cell; seeds winged or not.*

○ Ovary 2-4-celled, the cells with numerous or rarely solitary ovules; capsules dry or rarely fleshy, variously dehiscing; seeds more or less winged or appendaged.

+ Flowers in dense heads, on a more or less thickened receptacle.

§ Fruit a berry or berry-like drupe, densely crowded on a receptacle or connate into a syncarp; ovules and seeds erect and solitary in each cell.

Berries usually united in a syncarp; seeds appendaged; trees or shrubs, rarely climbing . . . . . *Morinda.*

§ § Capsules dry or rarely fleshy, dehiscing from the base or otherwise, rarely indehiscent.

† Capsules berry-like, dehiscing from the base, united in a syncarp.

Capsules 2-celled, or 2-celled with superposed 2 spurious sterile cells *Sarcocephalus.*

†† Capsules dry, not connate, opening loculicidally or septicidally into 2 many-seeded cocci, rarely indehiscent and 1-seeded.

△ Ovary-cells many ovuled; capsules dehiscent.

Flowers with or without angular clavate bractlets; capsules dehiscing into 2 many-seeded cocci; trees or rarely shrubs . *Nauclea.*
Flowers sessile or pedicelled, without bractlets; capsules 2-celled, opening by longitudinal slits; scandent shrubs . . . *Uncaria.*

△ △ Ovary-cells 1-ovuled.

Calyx- and corolla-lobes alternating with minute accessory teeth; flowers 4-merous, surrounded by linear-clavate bractlets; fruit 2-4-coccous . . . . . *Cephalanthus.*

base, on a 3-4 lin. long petiole, bluntish, almost coriaceous, 2-3 in. long, smooth and glabrous, glossy above; flowers large, 2½-2 in. long, glabrous, sessile, on a strong, stiff, 3-4 lin. long peduncle arising from the leaf-axils; calyx-tube nearly 3 lin. long, smooth, the limb widely funnel-shaped, nearly a line long, shallowly 4-toothed.

HAB.—Ava, Kakhyen hills.—Fl. Apr.

SCYPHIPHORA, Gaertn.

Calyx-limb truncate or minutely toothed. Corolla-tube cylindrical or slightly dilated upwards, 4- or 5-lobed, imbricate. Anthers exserted. Ovary truly 2-celled with 2 ovules in each cell, but each cell divided by a spurious dissepiment into 2 superposed ones, with a single ovule in each, the upper ovule apparently erect, the lower one pendulous; style filiform, with 2 short linear stigmatic lobes. Fruit a drupe, with a hard putamen hardly separable into pyrenes, with 4 spurious 1-seeded cells superposed by pairs, or fewer by abortion. Albumen none.—Glabrous thick-leaved shrubs, with broad and short interpetiolar stipules. Flowers in small peduncled axillary cymes.

1. **Sc. hydrophyllacea,** Gaertn.; Bedd. Sylv. Madr. 134-3.—An evergreen (6—8 + 3—4 + ½—¾) pygmæan tree, with a spherical crown and simple stem hardly exceeding 4 ft. in. height, all parts quite glabrous; leaves obversely oval or obovate, acute at the base, on a ⅓ to ⅔ in. long petiole, 1½-2 in. long, rounded at the apex, entire, coriaceous and glossy, quite glabrous; flowers whitish or reddish white, almost sessile, forming a small, dichotomously branched, very short-peduncled glabrous cyme in the axils of the leaves; calyx about 2 lin. long, the limb truncate or sinuate-truncate; corolla villous inside, the tube as long as the calyx, the lobes half as long, oblong; drupes elliptically oblong, almost wingedly 8-keeled (the keels more or less undulate), about ⅓ in. long, glabrous, containing a spuriously 4- or by abortion fewer-celled corky-woody putamen.

HAB.—Not unfrequent in the mangrove swamps of the Andamans.—Fl. May. —s.—SS. = Sal.

RUBIACEÆ.

Calyx-tube adnate to the ovary, the limb entire or lobed or toothed. Corolla gamopetalous, inserted round the epigynous disk, 4-5- or sometimes more (rarely only 3-) -lobed, the lobes imbricate or valvate. Stamens as many as corolla-lobes and alternating with them, inserted in the tube; anthers versatile, the cells parallel, opening longitudinally. Ovary inferior, 2- or more-celled, with 1 or more ovules in each cell, rarely 1-celled with parietal placentas

or reduced to a single 1-ovuled cell; style as many as carpels, high up united or simple, with a thickened, entire or lobed stigma. Fruit a capsule, berry, drupe or indehiscent nut. Albumen fleshy or horny, copious or rarely scanty or none. Embryo cylindrical, the cotyledons semiterete.—Trees, shrubs, or herbs, sometimes climbing, with opposite or whorled leaves. Stipules interpetiolar, either free or united with the petiole in a sheath bordered by fringes or leaf-like lobes or sheating or annular, rarely reduced to 1 or 2 points on each side of the petiole. Inflorescence various, usually more or less cymose or panicled, axillary or terminal. Flowers occasionally polygamous or unisexual.

A large order of great importance. It includes not only remedial agents acting as tonics, febrifuges, emetics and purgatives, but also formidable poisons and valuable dyes. *Cinchona* as a febrifuge is already too well known to require special notice, and thrives well in the Karen hills, east of Tounghoo, where it is cultivated by the Forest Department. Substitutes for Peruvian bark are specially *Rondeletia febrifuga, Hymenodictyon, Ophiorrhiza mungos,* and others. Gambier is the product of *Uncaria gambir.* Ipecacuanha (*Cephaëlis ipecacuanha*) is now cultivated in Burma and holds the first place amongst purgatives, and similar, although inferior, qualities obtain in *Richardsonia,* some species of *Spermacoces,* and our indigenous *Geophila reniformis.* The powdered fruit of *Randia dumetorum* is a powerful emetic, and its root bruised is used for poisoning fish. The root-bark of the Brazilian *Chiococca anguifuga* and *Ch. densifolia* produces the most violent emetic and drastic effects. Only few yield edible fruits like *Vangueria edulis,* which is introduced also into India. Coffee is the produce of *Coffea Arabica,* and thrives well in Burma, but is unfit for cultivation on a large scale, unless it be in the southern parts of Tenasserim. Madder-dye is obtained from *Rubia cordifolia* and *Hedyotis umbellulata,* and a much inferior dye, but much used in Burma and India, is the product of various species of *Morinda.* The timber of most rubiaceous trees is rather inferior, and the best comes probably from *Nauclea* and allied genera. Upwards of 180 species of this order are known to occur in Burma.

* *Fruit a more or less fleshy or succulent drupe or berry, 1-several-celled; ovules solitary or more in each cell; seeds never winged or appendaged.*

○ Ovary 2- or more-celled, the cells with a solitary, erect, or horizontal ovule. Berry with 2 or more (or by abortion only a single) thin-crustaceous or rarely membranous pyrenes enclosing the solitary seeds.

\+ Ovary 2-celled.

§ Corolla valvate in bud; albumen usually fleshy.

Calyx-limb entire; corolla-tube short; flowers clustered, sessile; epiphytical shrubs with large tuberous trunks . . . *Hydnophytum.*

Corolla-tube short, bearded at the throat; pyrenes flattened and

2- or 3-celled, with a single pendulous ovule in each cell; stigmas 3, rarely 4, sessile or on a very short style, free or united. Berry 1-seeded.—Small trees or shrubs, with simple or palmately-lobed leaves. Flowers small, in terminal cymes, umbels or panicles.

Leaves more or less stellately pubescent; cymes terminal . . *V. fœtidum.*
Leaves glabrous; cymes usually on axillary short branchlets. . *V. lutescens.*

1. **V. fœtidum,** Wall.—A shrub, 6-10 ft. high, the young shoots covered with a stellate scurfy pubescence; leaves elliptically oblong to oblong, cuneate at the 3-nerved base, on a rather short stellately pubescent petiole, blunt, acute or acuminate, coarsely sinuate-toothed, serrate or sometimes quite entire, 1-4 in. long, stellately pubescent above along the midrib and beneath all over, more or less scurfy along the midrib and in the nerve-axils; flowers small, bracteoled, forming a compound, umbelled, densely tawny-stellate and somewhat scurfy-pubescent cyme on a 1-2 in. long terminal peduncle, nude or involucred with 1-4 small bract-like floral-leaves; calyx-lobes broadly ovate; corolla glabrous, rotate, with a short tube; style short, broadly conical; ovary glabrous; berries compressed-ovate, acute, the size of a pepper-kernel, glossy.

Var. 2, **premnacea,** H.f. and Th.: cymes involucred with 3 to 4 small leaflets; leaves, etc., as in the normal form.

Var. 3, **grandifolia:** all parts more robust and more densely stellate-pubescent; leaves about 4 in. long, acuminate, 6-7-nerved on each side, the lower nerves not meeting at the base [in var. 1 and 2 the leaves are (besides the 3-nerved base) only 2-3-nerved on each side].

Hab.—Var. 1: Ava hills; var. 3: Burma, probably Ava.—Fr. Nov.

2. **V. lutescens,** Bl.—An evergreen shrub, 6 to 10 ft. high, the young shoots covered with a short tawny-stellate and scurfy pubescence; leaves from oblong to elliptical, on a stellate scurfy-pubescent petiole ½ to nearly an inch long, acute or shortly acuminate, copiously and coarsely serrate-toothed, nearly chartaceous, 4-7 in. long, glabrous, on each side 7-8-nerved, without basal nerves, the nerves beneath usually a little scurfy; flowers small, without bractlets, white, forming an umbelled, scurfy, stellate-pubescent, peduncled, compound cyme on a very short 2-foliate axillary branchlet, and, therefore, appearing spuriously axillary; bracts none or few, small, linear, at the summit of the peduncle; calyx-lobes oblong, concave; corolla glabrous or nearly so, rotate; stamens short; berries about 2 or 4 lines long, broadly ovate, mucronate, red, resembling those of the preceding species; pyrene compressed, with 3 slight furrows.

Var. 1, **Blumei** (*V. lutescens, Bl.*): berries elliptically oblong, nearly 4 lin. long.

Var. 2, **Colebrookeanum** (*V. Colebrookeanum*, Wall.) : berries broadly ovate, about 2 lin. long.

HAB.—Only var. 2 in Burma, probably Ava.

SAMBUCUS, L.

Calyx-tube ovoid or turbinate, the limb 3-5-toothed or -lobed. Corolla rotate or rotate bell-shaped, regular, 3-5-parted, imbricate or rarely valvate. Stamens 5, inserted at the base. Disk none or convex. Ovary 3-5-celled, with a solitary pendulous ovule in each cell; style short, 3-parted. Drupe berry-like, 3-5-pyrenous, the pyrenes crustaceous, 1-seeded.—Trees or shrubs, rarely undershrubs, with opposite unpaired-pinnate leaves, the leaflets serrate or laciniate. Flowers small, in umbeliate corymbs or panicles.

1. **S. Thunbergiana**, Bl.—An erect undershrub, all parts glabrous; leaves unpaired-pinnate, ⅓-1 ft. long, on an inch long or shorter petiole, glabrous; leaflets in 2-3 pairs with an odd one (the upper leaves reduced to a single pair), oblong or rarely linear-oblong, unequal at the acute base, shortly petioluled, without basal glands or stipulets, sharply serrate, acuminate, membranous, 2-4 in. long; flowers small, on a line long or somewhat longer capillary pedicels, forming a sessile or shortly peduncled glabrous or almost glabrous terminal spreading corymb, the branchings occasionally supported by a small leaf; calyx hardly ⅓ lin. long, the teeth acute; corolla about 1 lin. in diameter or a little larger; the lobes oval, blunt; drupes almost globular, the size of a small pepper-kernel.

HAB.—Ava, Kakhyen hills.—Fl. May.

LONICERA, L.

Calyx-tube ovoid or almost globular, the limb short (often unequally), 5-toothed, persistent or deciduous. Corolla tubular funnel-shaped or bell-shaped, the tube short or elongate, the limb unequal or 2-lipped, rarely almost regular, 5-lobed, imbricate. Stamens 5, the filaments inserted in the tube; anthers included or exserted. Disk cushion-like. Ovary 2-3-celled, with numerous ovules in each cell attached in two rows to the axial placentas; style filiform with a capitate stigma. Berry fleshy or sappy, 2-3-celled, or, from obliteration of the cell-walls, 1-celled, the cells many- or few-seeded.—Erect or scandent shrubs, with opposite simple leaves. Flowers in cymes or peduncled heads, sometimes by pairs and involucred by the often connate bracts.

1. **L. leiantha**, Kz.—A shrub, all parts glabrous, the branchlets whitish; leaves ovate to ovate-oblong, decurrent at the acute

++ Flowers in loose inflorescences, never in heads; inflorescence furnished with white floral leaves.

Capsule dehiscing septicidally into 2 woody valves; trees . . *Hymenodictyon.*

Capsule opening at the apex by 4 valves; epiphytical shrubs . *Hymenopogon.*

○○ Ovary 2-4-celled, the cells 1- or more-ovuled; capsules dehiscing variously at the apex or along their whole length, or separating into 2-4 cocci, rarely indehiscent; seeds never winged or appendaged, numerous or solitary.

+ Ovules and seeds several or numerous in each cell, attached laterally; capsules dehiscent.

Corolla tubular, twisted; capsules opening at the apex by 2 valves; trees or shrubs . . . . . *Wendlandia.*

++ Ovules and seeds solitary, pendulous; capsule drupe-like, crustaceous or pergamaceous, hardly dehiscing.

Corolla valvate; seeds contained in 2 thin-membranous wing-like expanded cocci; climbers . . . . . *Pæderia.*

HYDNOPHYTUM, Jack.

Calyx-tube short, the limb produced and truncate. Corolla funnel-shaped, the tube short-hirsute within, the limb 4-parted, valvate. Stamens 4, inserted at the throat; the filaments short. Ovary 2-celled, with a solitary erect ovule in each cell; style filiform, with a 2-lobed stigma. Drupe oblong or oval, containing 2 plano-convex 1-seeded coriaceous pyrenes. Embryo central in the fleshy albumen.—Small epiphytic shrubs, with an enlarged tuber-like trunk up to the size of a man's head and usually short branches. Stipules interpetiolar, minute. Flowers small, white, sessile, by 2 or more clustered and axillary.

1. **H. formicarum,** Jack.—An evergreen small epiphytic shrub with a tuber-like large trunk, from which the short, sparingly branched, somewhat succulent branchlets arise, all parts quite glabrous; leaves more or less obovate to elliptically oblong, narrowed into a very short (up to a line long) thick petiole or almost sessile, 2-4 in. long, blunt, entire, fleshy-coriaceous, smooth and glossy; flowers small, whitish, by 2 or more sessile in the axils of the leaves; calyx-limb cyathiform, truncate, small; corolla glabrous outside, the tube about a line long, the lobes as long as the tube, oblong, acute; berries oblong, crowned by the cyathiform calyx-limb, 2-3 in. long, smooth and glossy, orange-crimson.

Hab.—Frequent on trees in the mangrove swamps of South Andaman.—Fl. Fr. May-June.—l.

PSYCHOTRIA, L.

Calyx-limb short, truncate, or 4- or 5-lobed or -toothed, persistent. Corolla funnel-shaped, with a short tube naked or bearded at the throat, the limb 5- rarely 4-lobed, valvate. Stamens 5, rarely

4, included or somewhat exserted, the filaments short. Ovary 2-celled, with a solitary erect ovule in each cell; style simple, with a 2-cleft stigma. Drupes crowned with the calyx-limb, containing 2 plano-convex pyrenes, smooth or longitudinally furrowed or ribbed, spuriously ruminate or even. Embryo at the base of the homogeneous cartilaginous albumen; cotyledons leafy, lanceolate. —Trees, shrubs, or rarely undershrubs, with interpetiolar, free, or often connate and often very deciduous stipules. Flowers small, white, in axillary or terminal cymes.

* *Seeds plano-convex, without ribs or dorsal keel, enclosed in a white thin membrane.*

Small creeping undershrub, the stems and often also the nerves beneath shortly tomentose . . . . . *P. calocarpa.*

* * *Seeds plano-convex, with an obsolete longitudinal dorsal rib.*

Glabrous panicles elongate, raceme-like . . . . . *P. connata.*

As former, leaves larger; panicles thyrsoid or corymbose . . *P. platyneura.*

* * * *Pyrenes 3-gonous, the inner face flat, the 2 lateral ones more or less concave, forming a thick rib.*

× Quite glabrous, resembling *P. connata* . . . *P. symplocifolia.*

× × Tawny or rusty-hairy; flowers sessile, clustered, or in heads.

Flower-heads very small; leaves glabrous above . . . . *P. polyneura.*

Flower-heads rather large, compact; leaves hirsute on both sides . *P. Helferiana.*

* * * * *Pyrenes longitudinally ribbed and furrowed (ribs usually 5).*

× Flowers sessile or nearly so, clustered or in heads, forming cymes or panicles.

Leaves opaque; cyme compact, somewhat tomentose; bracts subulate *P. monticola.*

Leaves glossy; panicle whorled, thyrsoid, smooth; bracts broadly ovate . . . . . *P. adenophylla.*

× × Flowers pedicelled, in loose cymes or corymbs.

○ Small erect shrubs.

† Leaves thick, membranous or rather pergamaceous, turning more or less brownish in drying.

△ Drupe 4-5 lin. long, glabrous; cymes rusty-puberulous . . . . . *P. viridiflora.*

△ △ Drupe only 2-3 lin. long.

Cymes rusty-puberulous . . . . . *P. Andamanica.*

Cymes glabrous . . . . . *P. divergens.*

†† Leaves thin membranous and flaccid, remaining green; all parts glabrous . . . *P. viridissima.*

○ ○ Large scandent shrubs.

Corymbs at the lower branchings furnished with 2 opposite narrow floral leaflets . . . . . *P. sarmentosa.*

1. **P. calocarpa**, Kz.—A low, almost herbaceous undershrub, 1-1½ ft. high, with a creeping rhizome, the younger stems more or less puberulous from short debile crispate hairs; stipules 2-cleft, from a broader base subulate-acuminate and often brownish-pubescent at the apex; leaves from oblong to ovate-oblong, acute at the base, on a thick petiole often shortly crispate-tomentose on the back, acute to acuminate, 3-7 in. long, entire, pergamaceous, glabrous, or more usually shortly and often indistinctly puberulous

the throat, the tube wide-funnel-shaped, a line long or a little longer, the lobes not quite so long.

HAB.—Rather rare in the tropical forests of Martaban down to Tenasserim.

13. **P. sarmentosa,** Bl.—An evergreen large scandent shrub, all parts quite glabrous; stipules ovate-lanceolate, acuminate; leaves obovate-oblong to elliptically lanceolate, tapering in a 1-3 lin. long petiole, rather bluntish or bluntish and shortly acuminate or apiculate, 1½-2½ in. long, pergamaceous, entire, glabrous; flowers small, white, on very short pedicels, forming brachiate glabrous, terminal cymes on a compressed 4-gonous ½-1 in. long peduncle furnished by a pair of narrow floral leaflets at the lower branchings; calyx minute, 5-toothed, glabrous; corolla villous at the throat, the tube wide and almost bell-shaped, about a line long, the lobes half as long; berries almost oboval, the size of a pepper-kernel, crowned by the calyx-limb, glabrous; pyrenes 5-ribbed and -furrowed; albumen equable and furrowed.

HAB.—Upper-Tenasserim.—Fl. Apr.

CHASALIA, Comm.

Calyx-tube urceolate or ellipsoid, the limb truncate or 4-5-toothed, persistent. Corolla naked at the throat, more or less tubular funnel-shaped, the tube more or less elongate and sometimes curved, the limb rather short, 5- or 4-lobed, valvate. Anthers inserted at the middle or summit of the corolla-tube, included or exserted. Ovary 2-celled, with a solitary ovule in each cell attached midways of the central placenta. Berry ovoid to obovate, crowned by the calyx-limb, containing 2 one-seeded pyrenes perforated at their inner face by a longitudinal furrow, thus causing the seed to be more or less concave, the back convex and usually marked by an obsolete longitudinal rib. Albumen equable. Embryo small, basilar, with large ovate cotyledons.—Small shrubs, with ovate, usually connate, interpetiolar stipules. Flowers rather small, but conspicuous, in terminal cymes.

1. **Ch. curviflora,** Thw.—An evergreen small shrub or rather undershrub, 2-3 ft. high, all parts quite glabrous; stipules ovate, free or connate at the base; leaves oblong-lanceolate to obovate-oblong, acuminate at the base, on a ¼-1 in. long petiole, shortly and abruptly acuminate, 4-6 in. long, thin membranous, entire, glabrous; flowers rather conspicuous, white, with a yellow throat, on very short, thick, white pedicels arranged in a smooth purplish-coloured terminal brachiate cyme; bracts small, lanceolate, acuminate; calyx nearly a line long, the teeth broadly ovate; corolla tubular funnel-shaped, ⅔ in. long, glabrous; berries globular, the size of

a pea; the pyrenes hemispherical with a longitudinal obsolete rib on the back; albumen equable.

HAB.—Not unfrequent in the tropical forests from Martaban down to Tenasserim and the Andamans.—Fl. Apr. May.—s.

IXORA, L.

Calyx-tube ellipsoid or almost obversely conical, the limb small, 4- or rarely 5-toothed or -lobed. Corolla salver-shaped, the tube usually more or less elongate and slender, the limb 4- or rarely 5-lobed, twisted in the bud. Anthers almost sessile at the throat, usually exserted. Ovary 2-celled, with a solitary ovule in each cell peltately attached to the axial placenta or rarely near the base; style elongate, exserted, the stigma entire or 2-lobed. Fruit a globular or ellipsoid small berry or drupe, containing 2 pergamaceous or rarely crustaceous one-seeded pyrenes. Seeds planoconvex or the inner face more or less concave.—Trees or shrubs, with free or at the base usually connate interpetiolar stipules. Flowers often showy, in more or less crowded larger or smaller corymbose cymes or panicles, terminal and axillary.

* *Flowers* 5*-merous; panicles long-peduncled.*

Leaves glabrous, membranous . . . . . *I. Helferi.*

Leaves almost coriaceous, more or less shortly pubescent beneath . *I. longifolia.*

** *Flowers* 4*-merous.*

○ *Style exserted to the same or nearly the same length of the tube, the stigma simple and thick, spindle-like.*

× Corolla-tube only 3 lin. long; flowers sessile or nearly so.

\+ Flowers in dense heads.

Glabrous, turning black in drying . . . . . *I. compactiflora.*

\++ Flowers in cymes or corymbs.

Glabrous, the corymbs puberulous and recurved; berries crowned by the calyx-lobes . . . . . *I. recurva.*

Glabrous, also the erect or nearly erect corymbs; berries marked by the circular scar of the fallen calyx-limb . . . . *I. weberœfolia.*

×× Corolla-tube ½-⅔ in. long; flowers pedicelled.

All parts and inflorescence glabrous, not turning black in drying . *I. pavetta.*

All parts more or less puberulous to tomentose, usually turning black in drying; inflorescence shortly puberulous . . . *I. tomentosa.*

All parts villous-pubescent, not turning black in drying; inflorescence villous from spreading hairs . . . . . *I. naucleiflora.*

○○ *Styles shorter or longer exserted, never exceeding the tube by more than* ½-⅔ *of its length; stigmatic lobes usually spreading, rarely longer cohering.*

× Flowers white or rarely pale rose-coloured (never orange or scarlet).

\+ Corolla shortly puberulous or pubescent outside.

All parts more or less pubescent; cyme rather small, almost sessile; leaves sessile . . . . . *I. Brunonis.*

\++ Corolla quite glabrous, except the throat inside in very few species.

△ Panicle thyrsoid, brachiate, trichotomous, more or less long-peduncled.

deciduous; leaves lanceolate to oblong-lanceolate, acuminate at both ends, on a ½-1 in. long petiole, 4-6 in. long, entire, thick membranous, glabrous, somewhat glaucescent; flowers small, white, sessile, densely crowded into 3 short-peduncled or almost sessile bracted heads on a ½ to 1½ in. long strong peduncle, arising solitary from the end or from the forkings of the branchlets; peduncle and branchings often somewhat villous; calyx about a line long, glabrous or a little pubescent-fringed, 5-cleft, the lobes lanceolate, subulate-acuminate; corolla glabrous, villous at the throat, the tube about a line long, the lobes as long; berries oblong, the size of a pea, red and lucid, crowned by the calyx-limb; pyrenes longitudinally furrowed and ribbed (ribs 3 or 4); albumen spuriously ruminate.

Hab.—Frequent in the damper hill forests of the Martaban hills down to Upper Tenasserim, at 3,500 to 6,000 ft. elevation.—Fl. Fr. March-Apr.— s.—SS. =Metam.

8. **P. adenophylla,** Wall. — An evergreen small shrub, all parts glabrous; stipules ovate-oblong, glabrous; leaves obovate-lanceolate to obovate-oblong, acuminate at the base, tapering in a 3-6 lin. long petiole, shortly and rather abruptly acuminate or apiculate, 3-5 in. long, entire, coriaceous, glabrous, more or less glossy on both sides; flowers small, greenish, sessile or nearly so, collected into small heads on 3-6 lin. long thick pedunclets (the lower ones almost whorled), forming a shorter or longer robust, quite smooth, longer or shorter peduncled, small-bracted panicle at the end of the branchlets; bracts ovate, acute, often fringed; calyx short, shallowly cup-shaped, with 5 very short and rather obsolete teeth; corolla about a line long, glabrous, villous at the throat.

Hab.—Tenasserim (or Andamans ?).

9. **P. viridiflora,** Rwdt. — An evergreen small shrub, all parts quite glabrous; stipules ovate, acuminate, deciduous; leaves lanceolate to obovate-lanceolate, tapering into a ¼ in. long petiole, acuminate, 4-5 in. long, entire or waved, membranous, glabrous, in drying usually turning brown; flowers small, greenish white, on very short pedicels, cymulose, forming a short-peduncled puberulous cyme at the end of the branchlets; calyx short, a little puberulous, the teeth shorter or longer, lanceolate; corolla about a line long, the tube wide, glabrous, villous inside at the throat; berries elliptical or oblong, 4-5 lin. long, crowned by the short calyx-limb, red and glossy, smooth; pyrenes 5-ribbed and -furrowed; albumen slightly and spuriously ruminate on the surface.

Var. 1: stipules broad and rather large; leaves entire; cymes puberulous; calyx-teeth inconspicuous.

Var. 2, **undulata**: as preceding, but leaves waved and the calyx-teeth about ½ lin. long.

HAB.—Var. 2: Chittagong.

10. **P. Andamanica,** Kz. — An evergreen small shrub, all parts glabrous; stipules large, oval, 2-cleft, deciduous; leaves obovate to oblong-lanceolate, tapering into a ¼ to 1 in. long petiole, shortly acuminate, 5-10 in. long, entire, thin coriaceous, glabrous, turning brownish in drying; flowers small, greenish white, on very short pedicels, forming a short peduncled or almost sessile often somewhat rusty-puberulous cyme at the ends of the branchlets; calyx hardly ½ a line long, almost truncate, or the lobes short and broad, glabrous; corolla about a line long, villous at the throat; berries elliptical, about 3 lin. long, crowned by the truncate calyx-limb, smooth; pyrenes 5-ribbed and -furrowed; albumen equable, spuriously ruminate-furrowed on the surface.

HAB.—Not unfrequent in the tropical forests of South Andaman.—Fl. Fr. Apr.-May.—s.

11. **P. divergens,** Bl.—An evergreen small shrub, 1½-2 ft. high, all parts glabrous; stipules variable, ovate to oblong, often very large and elongate, entire or 2-cleft; leaves from lanceolate to linear-lanceolate, tapering into a ½-1 in. long petiole, acuminate, 5-8 in. long, entire, firmly membranous or almost thin coriaceous, glabrous, usually turning brownish in drying; flowers small, greenish white, on very short pedicels, cymulose and forming a shorter or longer peduncled, glabrous, trichotomously branched cyme at the end of the branchlets; calyx glabrous, about ½ a line long, obsoletely toothed or almost truncate; corolla in some plants less than a line, in others nearly twice as long, villous at the throat, the lobes as long as the tube; berries ovoid, about 2-2½ lin. long, smooth, crowned by the calyx-limb; pyrenes longitudinally 5-ribbed and -furrowed; albumen equable, spuriously ruminate or rather 5-ribbed.

HAB.—Not unfrequent in the tropical forests of the Martaban hills east of Tounghoo down to Tenasserim; very rare in those of the eastern slopes of the Pegu Yomah.—Fl. May-June; Fr. Feb.-March.—s.

12. **P. viridissima,** Kz.—An evergreen small shrub, 1½-2 ft. high, all parts quite glabrous; stipules apparently broad and short, 3-angular, deciduous; leaves ovate-oblong to elliptically lanceolate, cuneately tapering in a rather slender ½-1½ in. long petiole, more or less acuminate, 4-7 in. long, entire, flaccid and thin herbaceous, glabrous and green; flowers small, whitish, on strong about a line long pedicels, forming a trichotomously branched short- (⅓-1 in. long) -peduncled quite glabrous cyme at the end of the branches; calyx glabrous, very short, obsoletely toothed; corolla bearded at

along the principal nerves beneath ; flowers small, white, on very short thick pedicels, forming a short- ($\frac{1}{2}$ in.) -peduncled, rather contracted, erect or sometimes nodding, shortly and sparingly tomentose cyme at the end of the branches, or with ripening of the fruits turning lateral from the development of the terminal shoots ; calyx nearly a line long, 4-cleft, the lobes lanceolate, blunt, green ; corolla white-villous within, the tube as long as the calyx-segments, the limb-lobes short, oblong, bluntish ; drupes crowned by the conspicuous calyx-lobes, elliptical, the size of a pea, very sappy, lucid and scarlet-coloured ; seeds covered only with a white thin membrane, plano-convex, without rib or keel ; albumen equable.

Hab.—Frequent in the tropical forests of Pegu and Martaban down to Tenasserim.—Fl. Aug.-Feb. ; Fr. Jan.-March.—s.—SS.=SiS. Metam.

2. **P. connata,** Wall. (*P. elongata,* Wight ; Bedd. Sylv. Madr. An. t. 17, f. 6).—An evergreen shrub, 3-5 ft. high, all parts quite glabrous ; stipules broad-ovate, connate, acute or 2-cleft, those sheathing the peduncle truncate ; leaves from oblong to oblong-lanceolate and elliptically obovate, acute at the base, on a $\frac{1}{2}$-1 in. long petiole, shortly and abruptly acuminate, 4-5 in. long, entire, thin coriaceous, glabrous ; flowers small, white, on very short ($\frac{1}{2}$ lin. long) thick pedicels, in small short-peduncled or almost sessile cymes arranged in a terminal, elongate, glabrous, peduncled panicle ; calyx broadly cup-shaped, truncate, about a line across ; corolla broadly funnel-shaped, the tube about a line long, the throat villous, the lobes half as long as the tube, triangular ; berries the size of a pepper-kernel or small pea, almost globular, smooth, purplish black, crowned by the small calyx-limb ; pyrenes hemispherical, smooth ; albumen spuriously ruminate.

Hab.—Frequent in the tropical and moister upper mixed forests of the Pegu Yomah and Tenasserim ; also Andamans.—Fl. Apr.-May ; Fr. C.S.

3. **P. platyneura,** Kz.—An evergreen shrub, all parts glabrous ; stipules large, broad-ovate, acute, glabrous ; leaves oblong to obversely oblong, tapering at the base, on a strong $\frac{1}{3}$-$\frac{1}{2}$ in. long petiole, shortly and rather abruptly acuminate, 4-6 in. long, entire, thin coriaceous, glabrous, with numerous parallel nerves and a broad midrib prominent on both sides ; flowers small, on short ($\frac{1}{2}$ lin. long) pedicels, in small cymes, forming a peduncled, brachiate, glabrous panicle at the end of the branchlets ; calyx short, glabrous ; corolla small, glabrous ; berries obovoid, rather broad, the size of a pea, black, succulent, smooth, crowned by the scar of the calyx-limb ; pyrenes half-obovoid-globose, smooth, on the back with a faint keel running out into a sharp-ridged base ; albumen spuriously ruminate.

Hab.—Frequent in the tropical forests of the Andaman islands.—Fl. May-June.—s.

4. **P. symplocifolia,** Kz.—An evergreen shrub, all parts glabrous; stipules broad-ovate, subulate-acuminate; leaves from obovate-lanceolate to elliptically obovate, at the base more or less tapering into a 2-3 lin. long petiole, shortly and abruptly acuminate or almost apiculate, 2½-4 in. long, entire, with the borders somewhat recurved, coriaceous, glabrous; flowers small, white, almost sessile, in small cymes arranged in a slightly tawny-puberulous, elongate peduncled panicle at the end of the branchlets; calyx cup-shaped, about a line in diameter, obsoletely 5-toothed; corolla small, glabrous outside; berries oblong, the size of a pea, smooth, bluish black; pyrenes with a strong longitudinal dorsal rib, and hence almost 3-gonous; albumen equable.

Hab.—In the drier hill forests of the Martaban hills east of Tounghoo, at 5,000 to 7,000 ft. elevation.—Fl. Fr. March.—SS.=Metam.

5. **P. polyneura,** Kz.—An evergreen shrub, all softer parts covered with a rusty-brown short pubescence; stipules large, broadly ovate, connate, 2-cleft at the apex, rusty-pubescent; leaves oblong-lanceolate to elliptically oblong, acute at the base, on a rusty-pubescent petiole ½-1½ in. long, 6-10 in. long, shortly acuminate, entire, membranous, glabrous above, minutely rusty-pubescent beneath, the lateral nerves numerous, crowded and parallel; flowers small, white, sessile, in small peduncled clusters arranged in trichotomous or almost whorled rusty-tomentose corymb-like cymes arising from the end of the branchlets; calyx rusty tomentose; berries unknown.

Hab.—Not unfrequent in the tropical forests of South Andaman.—Fl. May.—s.

6. **P. Helferiana,** Kz.—An evergreen shrub, all parts hirsute from stiff, short, brownish or blackish hairs; stipules lanceolate, acuminate, 2-cleft to near the base, densely appressed rusty-hirsute; leaves lanceolate, acuminate at both ends, on an appressed brown-hirsute petiole ½-1 in. long, 3-4½ in. long, entire, membranous, shortly hirsute on both sides; flowers minute, greenish white, sessile, in dense short-peduncled heads arranged in a short rather compact brown-hirsute cyme at the end of the branches; calyx brown-hirsute, about a line long, the teeth lanceolate; corolla glabrous, bearded at the throat, the tube nearly a line long, the lobes as long; berries oval, crowned by the hirsute calyx-limb, the size of a pea, sparingly hirsute, orange-coloured; pyrenes triangular, keeled on the back, flat on the inner face; albumen equable.

Hab.—Tenasserim (or Andamans?).

7. **P. monticola,** Kz.—An evergreen low shrub, 1-3 ft. high, all parts glabrous; stipules 2-cleft, lanceolate or broad, acuminate,

† Panicle without sessile floral leaves at or above the base of the peduncle.

§ Style glabrous; panicle pubescent. Shrubs.

Leaves puberulous beneath; corolla-tube 1-1¼ in. long . . *I. villosa.*

Leaves and branchlets glabrous; corolla-tube ½ in. long . . *I. cuneifolia.*

§ § Style hairy; panicle minutely puberulous. Trees.

All parts glabrous; flowers sessile; calyx-tube only 2-2½ lin. long . . . . . *I. parviflora.*

†† Panicle furnished with a pair of sessile more or less cordate or oval floral leaves at or above the base of the peduncle.

§ Corolla-throat bearded.

Glabrous; corolla-tube an inch long . . . . . *I. barbata.*

§ § Corolla-throat nude, the tube 5-6 lin. long.

Leaves coriaceous, pale-coloured beneath; panicle puberulous; flowers sessile . . . . . *I. spectabilis.*

Leaves membranous, thin pergamaceous, one-coloured; pedicels 1-2 lin. long; panicle glabrous . . . . . *I. diversifolia.*

Leaves of a thin texture, turning black in drying; panicle glabrous; pedicels 1-2 lin. long . . . . . *I. nigricans.*

△ △ Cymes small, short-peduncled or sessile, or the panicles reduced to 3-chotomous short-peduncled or sessile large cymes and appearing as if consisting of 3 or more terminal peduncled cymes.

† Cymes small, short-peduncled or sessile; flowers and fruits sessile or very shortly pedicelled.

§ Flowers sessile; corolla-tube ½-⅔ in. long; the throat nude.

Shrub; leaves sessile, with rounded or cordate base; cyme glabrous. *I. memecylifolia.*

Shrub; leaves petioled, with acute or obtuse base; cyme glabrous . *I. sessiliflora.*

Tree; leaves petioled, with acute or obtuse base; cyme puberulous . *I. rugosula.*

§ § Flowers shortly pedicelled; corolla-tube 1½-2 in. long, the throat bearded.

Glabrous, also the inflorescence; leaves sessile or nearly so . . *I. Brandisiana.*

†† Corymbose cymes short-peduncled or sessile, so as to appear to consist of 3 or more terminal peduncled cymes. Flowers and fruits (as in true *Pavettas*) conspicuously (1-3 lin.) pedicelled.

§ Leaves acuminate or acute at the base, on ½-1 in. long petioles.

Shrub; leaves pale-coloured beneath; flowers pale rose; corolla-tube an inch long . . . . . *I. rosella.*

Tree; leaves one-coloured; flowers white; corolla-tube nearly an inch long . . . . . *I. macrosiphon.*

§ § Leaves sessile or nearly so, with a rounded or cordate base.

Tree; cymes on 1-1½ in. long peduncles . . . . . *I. brunnescens.*

× × Flowers orange to deep scarlet (rarely, in garden varieties chiefly, white or pale rose-coloured, and in this case the corolla-lobes are always broader than in those of the white-flowered section). Calyx-teeth in Burmese species all very short.

Glabrous, also the inflorescence; calyx-teeth blunt; corolla-tube 1-1¼ in. long, the lobes almost orbicular . . . . *I. stricta.*

Glabrous; inflorescence puberulous ; calyx-teeth acute; corolla-lobes more or less acute . . . . . *I. coccinea.*
Glabrous, also the inflorescence, of the calyx-teeth 2 acute and 2 blunt; corolla-lobes acute or almost acuminate . . . *I. glaucina.*

* *Flowers* 5-*merous.*

1. **I. Helferi.** Kz.—An evergreen probably a shrub, all parts glabrous; stipules broadly ovate, acuminate, glabrous; leaves oblong-lanceolate, acuminate at both ends, on a 3-4 lin. long petiole, entire, 5-8 in. long, thin-membranous, glabrous, turning black in drying; flowers rather large, on a thick puberulous up to a line long pedicel, cymulose and forming a long-peduncled brachiate sparingly puberulous thyrsoid panicle bearing at the first branching a pair of more or less diminutive leaflets; bracts linear-subulate, along with the floral stipules glabrous; calyx nearly $1\frac{1}{2}$ lin. long, minutely puberulous, the 5 teeth nearly as long as the tube, lanceolate, acute; corolla (in bud) minutely tawny-pubescent on the outside of the $\frac{1}{2}$ in. long tube, the lobes about half as long.

Hab.—Tenasserim.

2. **I. longifolia,** G. Don.—An evergreen shrub, all softer parts shortly pubescent; stipules ovate, acuminate, appressed-pubescent; leaves oblong-lanceolate, almost cuneate-narrowed at the base, on a puberulous petiole $\frac{1}{2}$-1 in. long, shortly acuminate, 5-10 in. long, entire, glabrous above, more or less densely and shortly pubescent beneath, pergamaceous or almost coriaceous, turning black in drying; flowers.....on a line long pubescent pedicels, in peduncled cymes, forming a brown-pubescent or almost hirsute brachiate long-peduncled thyrsoid panicle; bracts linear-lanceolate to subulate, along with the floral stipules densely hirsute; calyx nearly 2 lin. long, hirsute, 5-toothed, the teeth linear-lanceolate, nearly as long as the tube; corolla not seen; berries ovoid, the size of a pea, crowned by the calyx-limb, sparingly hirsute, usually 2-seeded.

Hab.—Rare in the tropical forests of Martaban east of Tounghoo.—Fl. May or June (?)—s.—SS.=Metam.

** *Flowers* 4-*merous.*

○ *Style exserted to the same or nearly the same length of the corolla-tube; stigma simple and thick, spindle-shaped.*

3. **I. compactiflora,** Kz.—An evergreen tree, or probably a shrub, all parts quite glabrous; stipules shortly ovate, acute; leaves elliptically to broadly lanceolate, at the cuneate base tapering in a strong petiole $\frac{1}{4}$-$\frac{1}{2}$ in. long, rather long-acuminate, 3-5 in. long, entire, almost pergamaceous, quite glabrous, drying blackish; flowers small, sessile or nearly so, forming a dense involucred head of about an inch in diameter at the end of the former year's

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branchlets, but appearing lateral on account of the growing out of the terminal shoots; involucral bracts small and inconspicuous, broad-ovate, imbricate; calyx about a line long, glabrous, the teeth oblong, rounded, ½ a line long; corolla glabrous, the tube only 3 lin. long, rather wide, the lobes oblong, blunt, as long as the tube.

HAB.—Upper Tenasserim, at 2,000 ft. elevation.—Fl. Apr.

4. **I. recurva** (*Pæderia recurva*, Roxb.).—A slender shrub, all parts glabrous; stipules from a broad base subulate-acuminate, the point hairy; leaves opposite, short-petioled, lanceolate, acuminate, entire, about 6 in. long, pretty smooth on both sides; flowers white, on 1-2 lin. long pedicels 2-bracteoled at the middle, arranged into a short-peduncled, recurved, villous (in Roxburgh's figure puberulous) brachiate, corymb-like cyme at the end of the branches (and in Roxburgh's figure also axillary); bracts small, lanceolate; calyx hairy, 5-cleft, the lobes lanceolate, persistent; corolla funnel-shaped, about ½ an in. long, a little hairy on the outside, the limb 5-lobed, the lobes obliquely oblong, twisted, as long as the tube; anthers linear, erect, inserted at the throat, almost sessile; ovary hairy, 2-celled, with a solitary ovule in each cell; berry globular, the size of a pea, bluish black, smooth, when dry striated, crowned by the calyx-limb, 2-celled; seeds solitary, plano-convex, on the inner face a deep pit filled with the spongy receptacle; integument single, thin.—(From Roxburgh's Flor. Ind.)

HAB.—Chittagong, in moist situations amongst the hills.—Fl. H.S.; Fr. Oct.-Nov.

5. **I. weberæfolia**, Kz.—A small evergreen tree (25—30+8—12+2—3), all parts glabrous; stipules broadly ovate, acute, usually 2-cleft; leaves elliptically lanceolate to oblong and ovate-oblong, acuminate at both ends, on a 2-7 lin. long petiole, 6-3 in. long, coriaceous, glabrous, turning quite black in drying; flowers middling-sized, white, on stout up to 2 lin. long pedicels, forming a shortly peduncled or almost sessile, glabrous, brachiately trichotomous corymb at the end and in the forkings of the branches; calyx about 2 lin. long, the lobes broad and blunt; corolla funnel-shaped rotate, villous at the throat, the tube not much longer than the calyx, the lobes oblong, blunt, nearly 3 lin. long; berries globose, the size of a large pea, crowned by the circular scar of the fallen calyx-limb, smooth, black.

HAB.—Frequent in the coast forests of the Andamans.—Fl. Fr. ∞.—s.

6. **I. pavetta**, Roxb. (*Pavetta indica*, L.; Bedd. Sylv. Madr. 134-7).—A large shrub, all parts glabrous; stipules broadly ovate, mucronate or acute; leaves obovate-oblong to obovate-

lanceolate, acuminate at the base, on a slender petiole ¼-½ in. long, shortly and abruptly acuminate or bluntish, 3-5 in. long, entire, thin-membranous, yellowish green and not turning black in drying, quite glabrous; flowers rather small, but showy, white, on glabrous pedicels of various length (1-3 lin.), forming a short-peduncled or almost sessile, glabrous, corymbose cyme at the end of the lateral, or rarely also of the terminal, branchlets; calyx more than ½ a line long, glabrous, sinuate-toothed; corolla glabrous, the tube 4-5 lin. long, the lobes ⅓ so long; berries globular, the size of a pea, glossy, marked by the circular calyx-limb, smooth, black when fully ripe.

HAB.—Not unfrequent in the tropical forests of the Andamans.—Fl. May-June.—s.

5. **I. tomentosa,** Roxb. (*Pavetta tomentosa,* Smith; Bedd. Sylv. Madr. 134-7; Brand. For. Fl. 275).—A leaf-shedding treelet, (15—20 + 8—10 + 1—1½) often remaining shrubby, all softer parts more or less pubescent, puberulous, or sometimes almost glabrous; stipules broadly triangular, more or less abruptly acuminate, puberulous or pubescent; leaves from elliptical and elliptically ovate to oblong-lanceolate, on a ½-1 in. long petiole, 4-6 in. long, shortly and rather abruptly acuminate to bluntish, entire, firmly membranous, beneath pubescent, puberulous or rarely shortly tomentose, above more or less roughly puberulous, rarely almost glabrous; flowers showy, rather large, pure white, on 2-4 lin. long usually slender puberulous pedicels, forming puberulous or pubescent, almost sessile, corymbose cymes at the end of the lateral, and sometimes also of the terminal, branchlets; calyx ½ a line long, sinuate-toothed, greyish puberulous; corolla glabrous, the slightly curved tube varying in length from ⅓-⅔ in.; berries globular, the size of a pea, when fully ripe black, usually opaque and smooth.

Var. 1, **Roxburghii:** leaves, etc., more or less pubescent, especially beneath.

Var. 2, **glabrescens:** leaves of a thinner texture, only sparingly and minutely puberulous, especially beneath, or quite glabrescent.

HAB.—Frequent in all leaf-shedding forests, especially the mixed ones, from Ava and Martaban down to Tenasserim; var. 1: especially on permeable substrata and alluvium; var. 2: on impermeable ones.—Fl. June-July; Fr. C.S.—s × l.

8. **I. naucleiflora,** Kz.—A shrub or tree, all softer parts villous-pubescent; stipules pubescent, shortly and broadly ovate, acuminate; leaves oblong to broad-lanceolate, on a pubescent or villous petiole ½-1 in. long, acute at the base, rather shortly acuminate, 3-5 in. long, entire, firmly membranous, above shortly,

afterwards somewhat roughish, pubescent, beneath more or less softly pubescent or almost villous; flowers white, rather small, on tawny-villous slender 4-6 lin. long pedicels, forming an almost sessile, rather compact, yellowish or tawny-villous, corymbose cyme at the end of the branchlets; calyx about ½ lin. long, villous from spreading tawny hairs, the teeth short and acute; corolla sparingly pubescent outside, the tube slender, about ½ in. long, the lobes short, only ¼ so long, elliptically oblong, blunt; berries globular, the size of a small pea, when fully ripe black, sparingly and shortly hairy.

Hab.—Upper Tenasserim.—Fl. Feb.

○ ○ *Style shortly or longer exserted, but never exceeding the length of the corolla-tube by more than ½-⅔; stigmatic lobes usually spreading, rarely longer cohering.*

× *Flowers white or rarely pale rose-coloured (never orange or scarlet.)*

9. **I. Brunonis,** Wall.—An evergreen small, simple or little-branched shrub, 2-4 ft. high, the terete stems tawny or brown pubescent, all other parts less so; stipules connate at the base, lanceolate, long-bristly-acuminate, up to ⅔ in. long; leaves obovate-oblong to almost lyrate-obovate, almost sessile, cordate at the base, shortly and rather abruptly acuminate, 6-10 in. long, entire, thin-chartaceous, shortly and thinly pubescent on both sides; flowers rather small, pale rose- or almost flesh-coloured, on very short puberulous pedicels, forming a very small terminal, very shortly peduncled, pubescent, rather dense corymbose cyme; calyx nearly a line long, the teeth short, lanceolate, acute; corolla shortly pubescent outside, the tube slender and nearly an inch long, the lobes about ¼ as long, oblong, rather acute; style hardly exserted.

Hab.—Rather rare in the tropical forests on the eastern slopes of the Pegu Yomah (Khaboung).—Fl. Apr.-May.—s.—SS.=SiS.

10. **I. villosa,** Roxb.—An evergreen shrub, 3-6 ft. high, the branchlets shortly puberulous; stipules from an ovate base long-acuminate, puberulous; leaves obovate-oblong to oblong, often somewhat cuneately narrowed towards the rounded or acute base, on a thick puberulous petiole 2-4 lin. long or rarely longer, shortly and usually bluntish acuminate, 5-9 in. long, entire, chartaceous, glabrous above, softly puberulous beneath; flowers pure white, rather conspicuous, on very short puberulous pedicels, cymulose, and forming a shorter or longer peduncled trichotomously brachiate pubescent terminal thyrsoid panicle furnished by a pair of small leaflets at the first branching; bracts linear-subulate; calyx nearly a line long, glabrous or nearly so, the teeth short, lanceolate, acute;

corolla glabrous, the tube slender, 1-1¼ in. long, the lobes elliptically oblong, a little notched, only 2-3 lin. long; berries globular, crowned by the small calyx-limb, the size of a large pea, smooth, red.

HAB.—Rare in the tropical forests of the eastern slopes of the Pegu Yomah (Khaboung river).—Fl. May.—s.—SS.=SiS.

11. **I. cuneifolia,** Roxb.—An evergreen shrub, all parts glabrous or rarely the young shoots minutely puberulous; stipules broadly ovate, shortly acuminate, glabrous or puberulous; leaves oblong to oblong-lanceolate or rarely ovate-oblong, rounded or obtuse at the base, on a 3-5 lin. long petiole, shortly acuminate, 4-7 in. long, entire, pergamaceous, glabrous or minutely puberulous beneath; flowers rather small, but conspicuous, pure white, on very short puberulous pedicels, cymulose, and forming a short-peduncled or sometimes sessile, trichotomously brachiate, shortly pubescent terminal thyrsoid panicle supported by a pair of stipule-like, ovate, acuminate, small leaflets at the first branching; bracts lanceolate, acuminate to subulate, along with the floral stipules more or less puberulous; calyx more than ½ lin. long, glabrous, the teeth lanceolate, nearly as long as the tube; corolla glabrous, the tube slender, about ½ an in. long or rarely longer, the lobes elliptically oblong, ⅓-¼ as long as the tube; berries obovoid, the size of a large pea, crowned by the small calyx-limb, smooth, red.

Var. 1, **Roxburghii:** panicle sessile or short-peduncled; leaves glabrous.

Var. 2, **puberula:** panicle usually longer-peduncled; leaves minutely puberulous beneath.

Var. 3, **pumila:** only 1-3 ft. high, simple or nearly so; flowers often pale rose-coloured; cymes small and short, but more slender.

HAB.—Frequent in the tropical forests of the Eastern slopes of the Pegu Yomah and Martaban down to Tenasserim; var. 3: in the Eng forests on laterite.—Fl. Feb.-Apr.—s.—SS.=*Metam.* SiS.

12. **I. parviflora,** Vhl; Bedd. Sylv. Madr., t. 222; Brand. For. Fl. 275.—An evergreen tree (25—30+10—12+2—3), all parts glabrous; stipules broadly lanceolate, acuminate; leaves obovate-oblong to elliptically oblong, rounded or obtuse at the base, on a thick petiole 1-2 lin. long or almost sessile, acute or blunt, 3-4 in. long, entire, thin-coriaceous, glabrous; flowers small, white, sessile, cymulose, forming a brachiate, trichotomous, short-peduncled, somewhat puberulous, thyrsoid panicle at the end of the branchlets; bracts lanceolate, small; calyx about ⅓ lin. long, glabrous, the teeth short, triangular, acute; corolla glabrous, the tube only 2-2½ lin. long; stigma shortly exserted; style pilose; berries glo-

bular, the size of a small pea, crowned by the small calyx-limb, when fully ripe, black, smooth.

Hab.—Not unfrequent in the dry, especially the mixed, forests of the Prome district.—Fl. March.—l.—SS.=CaS.

Remarks.—Wood reddish brown, close-grained, hard; takes a good polish.

13. **I. barbata,** Roxb.—A large shrub, all part glabrous; stipules ovate, mucronate; leaves oblong to ovate-oblong, the lower ones on ¼ to ½ in. long petioles, the upper ones more cordate-ovate and sessile or nearly so, rounded or obtuse at the base, shortly and often bluntish apiculate or bluntish acuminate, 5-8 in. long, entire, thin-pergamaceous, quite glabrous, green on both sides; flowers laxly arranged, white, on 2-4 lin. long pedicels, or those in the forks sessile, forming a brachiate, trichotomous, shorter or longer (1½-3 in.) peduncled, smooth, terminal, corymbose panicle furnished with a pair of sessile cordate-ovate leaves at its base; lower bracts lanceolate, upper ones linear, small; calyx more than ½ a line long, glabrous, the teeth triangular, acute, short; corolla glabrous, somewhat (in Indian specimens much so) bearded at the throat, the tube about an inch long, the lobes oblong, bluntish, about ¼ so long.

Hab.—Rather frequent in the forests of the Andamans.—Fl. May-June.—SS.=serpentine and chloritic rocks.

14. **I. spectabilis,** Wall.—An evergreen tree (20—25+5—10+1½—2), all parts glabrous; bark brownish, rather smooth, peeling off in thin little flakes, minutely corky-verrucose, about a line thick; cut pale-coloured; stipules ovate, abruptly acuminate; leaves oblong to obovate-oblong, acute or obtuse at the base, 5-9 in. long, usually acute, entire, thin-coriaceous, glabrous, pale-coloured beneath; flowers rather small, but showy, white, sessile, glomerate-cymulose, forming a large, long- (4-5 in.) -peduncled, brachiate, minutely puberulous, glabrescent, terminal, thyrsoid panicle furnished above the base with a pair of sessile cordate leaves; calyx puberulous, nearly ½ a line long, the teeth very short, acute; corolla glabrous, the tube slender, about 5 lin. long, the lobes oblong, bluntish, about ⅓ so long; berries didymous or globular, the size of a cherry-stone, smooth, purplish black, crowned by the minute calyx-limb.

Hab.—Frequent along choungs in the tropical forests from Arracan, Pegu, and Martaban down to Tenasserim.—Fl. May-June; Fr. Oct.-March.—s.—SS.=SiS. Metam.

Remarks.—Wood yellowish white, heavy, close-grained, hard and brittle, at exposure turning pale-coloured and blackish-streaked.

15. **I. diversifolia,** Wall.—An evergreen large shrub, all parts glabrous; stipules ovate, acuminate; leaves ovate to ovate-oblong

and oblong, the lower ones on a 3-4 lin. long petiole, the floral and uppermost ones sessile with a more or less rounded or almost cordate base, shortly and bluntish acuminate or apiculate, 4-6 in. long, entire, thin-chartaceous, glabrous; flowers rather small, white, shortly pedicelled, or those in the forks sessile, forming glabrous, long-peduncled (peduncle 3-4 in. long), more or less trichotomously-branched, terminal, corymbose cymes furnished at the base with a pair of cordate sessile leaflets; bracts small, lanceolate to linear; calyx minute, only about $\frac{1}{3}$ lin. long, glabrous, the teeth short, triangular; corolla glabrous, the tube stiff, 5-6 lin. long, the lobes about $\frac{1}{3}$ so long, oblong, blunt; style shortly exserted, the lobes spreading; berries the size of a pea, globular or didymous, crowned by the minute calyx-limb, smooth.

Hab.—Not unfrequent in the tropical forests along muddy choungs from Martaban down to Tenasserim.—Fl. Feb.; Fr. Apr.-May.—s.

16. **I. nigricans,** R. Br.—An evergreen tree (20—25+12—15 +$\frac{1}{2}$—1), or often only a large shrub, all parts quite glabrous and turning black in drying; bark 2 lin. thick, smooth, blackish; stipules shortly ovate, long and abruptly acuminate; leaves from obovate-oblong to oblong and oblong-lanceolate, more or less rounded at the base, on a very short (1-2 lin. long) petiole, bluntish or shortly acuminate, 3-4 in. long, thin-chartaceous, entire, glabrous, turning black in drying; flowers rather small, white, on slender but short pedicels, forming a minutely puberulous or almost glabrescent, sessile or shortly peduncled, terminal, trichotomous, corymbose cyme usually furnished with a pair of small leaflets at the base; bracts small, linear-subulate; calyx glabrous, about $\frac{1}{3}$ lin. long, the teeth as long as the tube, lanceolate, acute; corolla glabrous, the tube about $\frac{1}{2}$ in. long, the lobes linear-oblong, blunt or acute, nearly half as long as the tube; style long-exserted; stigmatic lobes filiform, spreading; berries globular or didymous, the size of a small pea, crowned by the small calyx-limb, smooth.

Var. 1, **nigricans proper:** corolla-lobes acute.

Var. 2, **erubescens:** corolla-lobes blunt.

Hab.—Var. 2: common in the swamp forests and along swampy borders of lakes and choungs, from Pegu and Martaban down to Tenasserim.—Fl. March-May.—s.—SS.=All.

Remarks.—Wood yellowish, rather heavy, coarse-fibrous, rather loose-grained, soft.

17. **I. rosella,** Kz.—An evergreen shrub, all parts glabrous; stipules ovate, acuminate; leaves from oblong-lanceolate to elliptically oblong, acuminate at the base, on a strong petiole $\frac{1}{2}$-1 in. long, shortly and rather abruptly acuminate, 6-9 in. long, entire, coriaceous, glabrous, pale-coloured beneath, the lateral nerves thin and

rather crowded, slightly curved and parallel; flowers rather small, pale rose-coloured, on 1-3 lin. long pedicels, cymulose, forming an almost sessile, brachiate, trichotomous, minutely puberous, corymbose cyme at the end of the branches; calyx ½ a line long, minutely puberous, the teeth minute, broad-triangular, acute and blunt; corolla glabrous, the tube slender, about an inch long, the lobes about ¼ as long, oblong, blunt; style short-exserted; stigmatic lobes thick, hardly separating; berries globular, the size of a very small pea, smooth, crowned by the calyx-limb.

Hab.—Frequent in the tropical forests of the Andamans.—Fl. May-June.

18. **I. macrosiphon,** Kz.—An evergreen tree (20—25+5—8+1—1½), all parts glabrous; stipules lanceolate, acuminate; leaves large, from ovate- and elliptically-oblong to oblong-lanceolate, rounded to acute at the base, on a strong petiole ¼-⅔ in. long, more or less acute, ½-1 ft. long, entire or nearly so, coriaceous, glabrous, fuscescent in drying, the lateral nerves thin and prominent; flowers rather large, white, on 1-2 lin. long pedicels, or those in the forks sessile, cymulose, and forming a brachiate, trichotomous, glabrous, sessile, thyrsoid panicle at the end of the branches; stipules lanceolate, connate, large; calyx hardly ½ a line long, glabrous, the teeth short, 3-angular, acute; corolla glabrous, the tube stiff, nearly an inch long, the lobes oblong, bluntish, about 5-6 times shorter than the tube; berries globular and didymous, the size of a pea, smooth, crowned by the minute calyx-limb.

Hab.—Not unfrequent in the coast forests, especially the beach jungles, of the Andamans.—Fl. May.

19. **I. brunnescens,** Kz.—An evergreen tree (20—25+6—10+1—1½), all parts glabrous; stipules from a broad base abruptly subulate-acuminate; leaves more or less obovate with a rounded or obtuse base, on a very thick and very short (up to a lin. long) petiole or almost sessile, blunt or bluntish apiculate, 4-6 in. long, entire or waved, coriaceous, glabrous, the lateral nerves approximate and rather parallel; flowers on slender pedicels, cymulose, forming a trichotomously brachiate, short- (1-1½ in.) -peduncled, quite glabrous, corymbose cyme at the end of the branchlets; calyx small, glabrous, the teeth minute, triangular, acute; berries globular, crowned by the calyx-limb, smooth, the size of a small pea.

Hab.—Frequent in the coast forests and beach jungles of the Andamans.—Fl. Apr.—s.—SS.=Aren. SiS.

20. **I. memecylifolia,** Kz.—An evergreen shrub, all parts glabrous; stipules from a broad base abruptly and long subulate; leaves ovate to ovate-oblong, almost sessile, with a rounded or nearly cordate base, acuminate, 2¼-4 in. long, entire, thin-coriaceous,

glabrous, turning blackish or fuscescent in drying; flowers small, sessile, forming a trichotomous, shorter or longer peduncled, glabrous, terminal, corymbose cyme usually supported by a pair of diminutive lanceolate leaflets; bracts small, linear; calyx glabrous, about a line long, the teeth nearly as long as the tube, lanceolate; corolla glabrous, the tube about 4 lin. long, the lobes nearly half so long; style stiff, long-exserted, 2-lobed.

HAB.—Upper Tenasserim.—Fl. Apr.

21. **I. sessiliflora,** Kz.—An evergreen, large, branchy shrub, all parts quite glabrous; stipules from a broad rounded base abruptly acuminate; leaves oblong to oblong-lanceolate, rounded at the base, on a thick 2-3 lin. long petiole, shortly acuminate, 3-4 in. long, entire, thin-coriaceous, glabrous; flowers pale rose-coloured, especially the tube, rather small, sessile, forming a rather small, trichotomous, glabrous, corymbose cyme on a $\frac{1}{2}$ in. long, glabrous, terminal peduncle; calyx about $\frac{1}{2}$ lin. long, glabrous, the teeth very short; corolla glabrous, the tube slender, nearly $\frac{2}{3}$ in. long, the lobes ovate-oblong, rather acute, 2 lin. long; stigma shortly exserted.

HAB.—Not unfrequent in the drier hill forests of the Martaban hills east of Tounghoo, at 3,000 to 4,000 ft. elevation.—Fl. Apr.—SS.=Metam.

22. **I. rugosula,** Wall.—An evergreen tree (20—25+10—12+ $1\frac{1}{2}$-2), all parts quite glabrous; leaves oblong to elliptically oblong, acute at the base, on a 2-3 lin. long petiole, shortly and abruptly acuminate or apiculate, 5-7 in. long, entire, pergamaceous, quite glabrous; flowers white, rather small, sessile or nearly so, forming a small sessile or almost sessile minutely puberulous cyme at the end of the branchlets; calyx a line long, a little short-hairy, the teeth lanceolate, acuminate, nearly as long as the calyx-tube; corolla glabrous, the tube slender, about $\frac{1}{2}$ an in. long, the lobes $\frac{1}{3}$ so long, oblong; stigma shortly exserted; berries irregularly elliptically oblong, the size of a cherry-stone, purplish, smooth, crowned by the indistinct calyx-limb.

HAB.—Very rare along choungs in the tropical forests towards the Kambala toung, Pegu Yomah; also Upper Tenasserim.—Fl. May; Fr. Feb.—s.—SS.= SiS.

23. **I. Brandisiana,** Kz.—An evergreen shrub, all parts glabrous; stipules from a broad base subulate-acuminate; leaves oblong-ovate to oblong, on a very short thick petiole or almost sessile with a rounded base, acuminate, 4-6 in. long, entire, thin-coriaceous, glabrous, turning black in drying; flowers very long, white (?), very shortly pedicelled, forming a small, trichotomous, minutely puberulous and very short peduncled slender cyme at the end of the branchlets; bracts small, lanceolate, acuminate, the upper ones narrower and smaller; calyx a line long, glabrous, the lobes

lanceolate, acute, as long as the tube; corolla glabrous, villous at the throat, the tube very slender, 1½-2 in. long, the lobes linear-oblong, acute, 3-3½ lin. long; style exserted, the stigmatic lobes very short.

Hab.—Upper Tenasserim.—Fl. July.

× × *Flowers crimson, scarlet, or orange.*

24. **I. stricta,** Roxb.—An evergreen, large, branchy shrub, all parts quite glabrous; stipules from a broad base acuminate; leaves oblong to elliptically oblong, rounded to acute at the base, on a very short (1-2 lin. long) thick petiole or almost sessile, shortly acuminate or bluntish, 2-5 in. long, thin-coriaceous or pergamaceous, entire, glabrous; flowers showy, scarlet to pale rose and white, shortly pedicelled, cymulose, forming a rather crowded, trichotomous, brachiate, shorter or longer peduncled or almost sessile, glabrous, corymbose cyme at the end of the branches; calyx ½ a line long, glabrous, the lobes as long as the tube, rounded; corolla glabrous, the tube slender, 1-1¼ in. long, the lobes about 2 lin. long, almost orbicular; berries globular or didymous, the size of a pea, glabrous, crowned by the small calyx-limb.

Var. 1, **Roxburghiana:** corymbs sessile or nearly so, rarely short-peduncled; leaves usually almost sessile and often rounded at the base.

Var. 2, **Blumeana** (*Pavetta Javanica*, Bl.): corymbs more lax, on a 1-1½ in. long peduncle; leaves on 1-2 lin. long petioles, usually acute at the base; flowers somewhat larger.

Hab.—Both varieties in Upper Tenasserim; also in tropical forests above Rangoon.—Fl. Jan.-Apr.

25. **I. coccinea,** L.—An evergreen, large, branchy shrub, all parts quite glabrous; stipules from an ovate base abruptly subulate-acuminate; leaves oblong to elliptically oblong and ovate, on a thick petiole ½-1 lin. long or almost sessile, rounded to almost cordate at the base, bluntish, acute or apiculate with a mucro, 1-3½ in. long, entire, coriaceous, quite glabrous; flowers rather large and showy, deep scarlet, on short pedicels, or those in the forks sessile, cymulose, forming a sessile or short-peduncled, indistinctly puberulous, trichotomously brachiate, corymbose cyme at the end of the branchlets; calyx about a line long, the lobes as long as the tube, lanceolate, acute; corolla glabrous, the tube about 1½ in. long, the lobes ovate to ovate-lanceolate, more or less acute; style shortly exserted, the stigmatic lobes spreading; berries elliptically oblong, the size of a pea, smooth, crowned by the minute calyx-limb.

Var. 1, **Linneana:** corolla-lobes ovate-lanceolate, very acute.

Var. 2, **Bandhuca** (*I. Bandhuca*, Roxb.) : corolla-lobes broadly ovate, bluntish; leaves usually all sessile with a cordate base, blunt with a mucro.

HAB.—Generally cultivated all over Burma, from Ava down to Tenasserim. —Fl. Nov.-March.

26. **I. glaucina**, Kz.—An evergreen shrub, all parts glabrous; stipules from a broad base abruptly subulate-acuminate; leaves oblong to elliptically-lanceolate, acute at the base, on a strong $\frac{1}{3}$-$\frac{2}{3}$ in. long petiole, shortly acuminate, 4-6 in. long, entire, thin-chartaceous, glabrous, glossy above or opaque; flowers conspicuous, scarlet, on thick very short pedicels, or those in the forks sessile, cymulose, forming a very short peduncled or almost sessile trichotomous, and rather crowded, glabrous, corymbose cyme at the end of the branchlets; calyx a line long, glabrous, the teeth short, triangular, 2 of them acute, the remaining 2 blunt; corolla glabrous, the tube slender, $1\frac{1}{2}$ in. long, the lobes about $\frac{1}{3}$ as long, ovate-lanceolate, acute or almost acuminate.

HAB.—Upper Tenasserim.—Fl. Feb.

COFFEA, L.

Calyx-tube ovoid or turbinate, adnate to the ovary, the limb minute, 4-7-toothed. Corolla funnel- or salver-shaped, the limb with as many lobes as calyx-teeth, imbricate and almost twisted in the bud. Stamens as many as corolla-lobes, inserted at the midde or summit of the corolla-tube, included or exserted. Ovary 2-celled, with a solitary ovule in each cell attached to the middle of the dissepiment; style filiform; stigma 2-cleft. Berry more or less elliptical to globular, crowned by the calyx-limb or truncate, containing 2- or by abortion a solitary, 1-seeded pergamaceous pyrene. Seeds plano-convex. Albumen horny. Embryo erect, with a terete radicle and leafy cotyledons.—Shrubs or trees, with interpetiolar free stipules. Flowers often sexually dimorphous, solitary or clustered, terminal or axillary.

× All parts quite glabrous and glossy. Berries peduncled.
Flowers in axillary clusters, very shorty pedicelled . . . *C. Arabica.*
Flowers usually terminal, rarely axiliary, on $\frac{1}{2}$-1 in. long pedicels . *C. tetrandra.*
× × The young shoots and nerves beneath sparingly pubescent; berries and flowers sessile . . . . *C. Bengalensis.*

1. **C. Arabica**, L.; Bedd. Sylv. Madr. 139-8, t. 17, f. 1; Brand. For. Fl. 276.—*Ka-pwot.*—An evergreen tree (20—30 + 4—8 + $1\frac{1}{2}$—2), usually kept low by culture, all parts quite glabrous and glossy; stipules broadly triangular, acute, glabrous; leaves oblong to oblong-lanceolate, acute at the base, on a 3-4 lin. long petiole, bluntish acuminate, entire or waved, thin-coriaceous, glabrous,

glossy; flowers middling-sized, white, on very short pedicels, forming almost sessile, cluster-like, glabrous cymes in the axils of the leaves; calyx glabrous, the limb minute, obsoletely repand-toothed or almost truncate; corolla funnel-shaped, the tube slender, 2-3 lin. long, the 5 lobes as long or longer; anthers exserted; berries elliptical to oblong, shortly pedicelled, the size of a cherry-stone, smooth, crowned by the very small calyx-limb, containing usually 2 (or by abortion 1) thin, crustaceous, 1-seeded pyrenes.

Hab.—Occasionally cultivated, especially in Tenasserim, but nowhere on a large scale.—Fl. March-May; Fr. Nov.-Jan.—s.

2. **C. tetrandra,** Roxb.—An evergreen tree (20—25+10—15+2—2½), all parts quite glabrous, the young branchlets 4-gonous; stipules broadly triangular, acuminate; leaves from broadly to oblong-lanceolate and elliptically oblong, acute at the base, shortly and bluntish acuminate or apiculate, 2½-4 in. long, entire or waved, thin-coriaceous, quite glabrous and glossy; flowers rather conspicuous, pure white, on ½-1 in. long, rather stiff, glabrous pedicels, arising almost umbellately by 3 and more from the apex of the short annual branchlets; calyx glabrous, nearly 1½ lin. long, almost truncate; corolla tubular funnel-shaped, the tube nearly 5 lin. long, the 4 or 5 lobes as long or longer, linear, acute; anthers included; berries globular, the size of a large pea, smooth, blackish purple, containing 2, or more usually by abortion a solitary, thin, crustaceous, 1-seeded pyrene.

Hab.—Not unfrequent in the tropical forests of the Martaban hills and Andaman Islands, up to 3,000 ft. elevation; also in Chittagong.—Fl. March-Apr.—s.—SS.=chloritic rocks, Metam.

3. **C. Bengalensis,** Roxb.; Bedd. Sylv. Madr. 159-8.—A leaf-shedding large shrub, the young shoots indistinctly pubescent; stipules crowded at the shortened branchlets, linear-subulate, stiff; leaves elliptically to ovate-oblong, acute at the base, on a slender 1-1½ lin. long petiole, acute to rather bluntish acuminate, 2-3 in. long, entire, membranous, glabrous, or indistinctly pubescent along the midrib beneath; flowers sexually dimorphous, sessile or nearly so, solitary or rarely by 2 or more at the end of the branchlets or in the axils of the leaves; corolla tubular funnel-shaped, the tube ½-1 in. long, the lobes more than half so long, oblong; berries elliptical to elliptically oblong, the size of a pea, smooth, crowned by the calyx-limb.

Hab.—Forests of Martaban down to Tenasserim; also in Chittagong.—Fl. Feb.-March.

SAPROSMA, Bl.

Calyx-tube ellipsoid to obconical, the limb short, entire or 4-6-toothed, persistent, sometimes somewhat oblique. Corolla more or

less funnel-shaped, usually velvety or puberulous outside, the limb 4-6-lobed, induplicate-valvate. Stamens as many as corolla-lobes, inserted at the throat; filaments very short. Ovary 2-celled, with a solitary erect ovule in each cell; style 2-cleft. Berry crowned by the calyx-limb, 1- or very rarely 2-seeded, the endocarp pergamaceous, adnate to the pericarp.—Trees or shrubs, usually ill-scented, with interpetiolar, entire, or fringed stipules. Flowers usually small, sessile or pedicelled, solitary or in axillary or terminal clusters or cymes.

× Flowers sessile, terminal.
Flowers solitary; stipules fringed and cut . . . . . *S. consimile.*
× × Flowers pedicelled, solitary, or by 3 or more in peduncled cymes.
Cymes few-flowered, long-peduncled, glabrous, by 2-4 axillary; corolla 4-merous; upper leaves usually ternary . . . *S. ternatum.*

1. **S. consimile,** Kz.—A glabrous shrub; stipules short, fimbriate-dissected, minutely puberulous; leaves lanceolate to ovate-lanceolate, acute at the base, on a short glabrous petiole varying from ½ to 3 lin. in length, long-acuminate, 1½ to 2½ in. long, entire, chartaceous, glabrous, usually with a gland in the nerve-axils, the midrib on the upper side usually broad and conspicuous; flowers (in bud only) solitary, sessile or nearly so, terminal between the stiff stipules; calyx glabrous; corolla puberous; berries almost sessile, obovoid, the size of a small pea, smooth, crowned by the calyx-limb and the short conical style-base, containing usually a solitary seed.

Hab.—Not unfrequent in the drier hill forests from Martaban to Tenasserim, at 3,000 to 5,000 ft. elevation.—Fr. Feb.—SS.=Metam.

2. **S. ternatum,** Bth. & H.f.—An evergreen small shrub, all parts glabrous or the young shoots puberulous; stipules very long and very deciduous, glabrous or puberulous; leaves opposite, the terminal ones usually whorled by threes, oblong-lanceolate to elliptically oblong, acute or acuminate at the base, on a 3-4 lin. long petiole, acuminate, 4-6 in. long, entire or nearly so, chartaceous, glabrous, or puberulous along the nerves beneath; flowers white, on ⅓ to ½ in. long at the upper end subulate-bracteoled pedicels, usually by threes, on 1-1½ lin. long glabrous peduncles arising by 2-5 from the axils of the leaves; bracts lanceolate, about a line long; calyx nearly 1½ lin. long, glabrous, almost obliquely and sinuately 4-toothed; corolla funnel-shaped, about ⅓ in. long, velvety outside, villous within, the limb 4-lobed; berries elliptical, pedicelled, by threes, in brachiate cymes, the size of a small pea, smooth, crowned by the calyx-limb, 1- very rarely 2-seeded.

Var. 1, **ternatum proper:** all parts quite glabrous.

Var. 2, **puberulum**: stipules, petioles and nerves beneath more or less pubescent.

HAB.—Var. 2: rather frequent in the tropical forests of the Andaman Islands.—Fl. May-June.—s.

LASIANTHUS, Jack.

Calyx-tube more or less hemispherical, the limb persistent, consisting of 4-6 (rarely 3) lobes or teeth, or rarely almost entire. Corolla funnel-shaped, the limb divided into as many lobes as calyx-segments. Stamens as many, inserted towards the throat of the corolla and included or rarely exserted; the filaments very short. Ovary 4-9-celled, with a solitary erect ovule in each cell; style divided into as many stigmatic lobes as cells to the ovary. Drupe more or less sappy, crowned by the calyx-limb, containing 4-9 coriaceous or crustaceous 1-seeded pyrenes. Albumen fleshy or almost horny.—Shrubs or undershrubs, sometimes of a disagreeable scent, with entire, free, interpetiolar stipules. Flowers small, in sessile clusters, or rarely in peduncled cymes in the axils of the leaves or sometimes terminal.

* *Flowers in clusters or peduncled cymes, the bracts very minute and usually deciduous.*

Flowers sessile; calyx glabrous, the lobes about the length of the tube; drupes crowned by the linear lanceolate calyx-teeth . *L. lucidus.*

Flowers very shortly pedicelled or almost sessile; calyx puberulous, the limb broad, with very short teeth; drupe crowned by the cyathiform-contracted, almost truncate calyx-limb . . . *L. constrictus.*

* * *Flowers in densely bracted sessile clusters, the bracts more or less conspicuous and often persistent.*

○ Calyx-segments about a line long or shorter; stipules small.

Leaves shortly petioled, puberulous beneath; outer bracts broad and blunt, but short; calyx-lobes lanceolate . . . . *L. stercorarius.*

Sparingly stiff-hairy; leaves almost sessile, oblique; bracts all linear-subulate, hirsute . . . . . *L. Wallichii.*

○ ○ Calyx-segments linear to linear-subulate, 3-5 lin. long, hirsute.

Leaves glabrous or nearly so; stipules very large and leafy, oval, involucrating the flower-heads . . . . . *L. stipularis.*

All parts brown-hirsute; outer bracts very large and leafy, ovate-acuminate; stipules lanceolate, small, not leafy . . . *L. cyanocarpa.*

1. **L. lucidus**, Bl.—An evergreen shrub, the young branchlets thinly appressed-pubescent; stipules lanceolate, pubescent, small; leaves oblong to ovate- and elliptically-lanceolate, often somewhat unequal and acute at the base, on an indistinctly pubescent or glabrous petiole 2-3 lin. long, 2-3 in. long, often long-acuminate, entire, chartaceous, glabrous or sparingly appressed hispid on the midrib beneath; flowers small, white, almost sessile, forming a few-flowered small bractless cluster in the axils of the leaves; calyx about 2 lin. long, the lobes half so long, linear; corolla nearly ½

an in. long, minutely puberulous outside, villous within; drupes blue, oval, the size of a pea, glabrous, sappy, crowned by the calyx-limb.

HAB.—Upper Tenasserim.—Fl. Feb.

2. **L. constrictus,** Wight.—An evergreen small shrub, the young branchlets thinly appressed-pubescent; stipules from a broad base acuminate, small, more or less appressed-pubescent; leaves lanceolate to oblong-lanceolate, acute at the base, on a slightly pubescent 2-3 lin. long petiole, 3-5 in. long, shortly acuminate, entire or little waved, pergamaceous, glabrous and glossy above, beneath, especially on the nerves, more or less puberulous from a minute yellowish down or rarely almost glabrous, rarely nearly pubescent; flowers small, on very short (½ lin. long) thick appressed-puberulous pedicels, forming by 2, 3, or more small puberulous clusters in the axils of the leaves or above the scars of the fallen ones; bracts minute, deciduous; calyx hemispherical, minutely pubescent, occasionally somewhat constricted at the throat, the limb shortly sinuate-toothed or almost truncate; corolla hirsute, the tube about ¼ inch long, the lobes as long; drupes ovoid, the size of a very small pea, glabrous, crowned by the rather large, almost truncate, at the base somewhat constricted calyx-limb.

HAB.—Common in the tropical forests of the Andamans; also all over Tenasserim.—Fl. Fr. Apr.-June.—s.—SS.=Metam. SiS.

3. **L. stercorarius,** Bl.—An evergreen low shrub, the branchlets more or less appressed-pubescent; stipules lanceolate, small, pubescent or glabrous, deciduous; leaves oblong-lanceolate to linear-oblong, acute or obtuse at the base, on a thick appressed-pubescent petiole 1-2 lin. long, 4-6 in. long, longer or shorter acuminate, entire, chartaceous, above glabrous and of a peculiar chagrin lustre beneath, especially along the nerves more or less covered with a minute yellowish down; flowers small, white, sessile or nearly so, forming short, densely bracted, compact, pubescent clusters in the axils of the leaves; outer bracts short and broad, blunt, appressed-pubescent; calyx more or less glabrous, the lobes lanceolate, about a line long, hirsute-ciliate; drupes ovoid, blue (?), about 3 lin. long, crowned by the calyx-limb.

HAB.—Frequent in the tropical forests of Upper Tenasserim and the Andamans.—Fl. March-Apr.—s.

4. **L. Wallichii,** Wight.—An evergreen slender, meagre, usually simple-stemmed shrub, 3-8 ft. high, the branchlets covered with brown spreading stiff hairs; stipules triangular-lanceolate, ciliate and often pubescent, small; leaves oblong to elliptically and almost ovate-oblong, oblique and rounded at the one side of the base, on a very short (½-1 lin. long) hirsute petiole or almost sessile,

shortly and rather abruptly acuminate, 2-3 in. long, entire and ciliate, chartaceous, more or less stiff-hairy on the midrib above and generally on the nerves beneath; flowers small, white, sessile, in smaller or larger hirsute bracted clusters in the axils of the leaves and occasionally at the end of the branchlets; bracts linear-subulate, up to ½ an in. long, hirsute; calyx hirsute, the lobes lanceolate, acuminate, shorter than the tube; corolla hispid, the tube nearly 2 lin. long; drupes ovoid, the size of a pepper-kernel, glabrous or nearly so, crowned by the short calyx-limb or its scar.

Hab.—Not unfrequent in the tropical forests from Martaban down to Tenasserim; also Andamans.—Fl. Apr.-May; Fr. March.—s.—SS.=Metam.

5. **L. stipularis,** Bl.—An evergreen low shrub, all parts glabrous or nearly so; stipules very large and conspicuous, broadly oval, ½ in. long and somewhat broader, glabrous; leaves elliptically oblong to oblong, obtuse at the base, on a glabrous petiole 2-3 lin. long, 3-5 in. long, shortly acuminate, entire, chartaceous, glabrous, on the midrib beneath often sprinkled with stiff deciduous hairs; flowers small, white, sessile, forming a densely-bracted, hirsute, axillary cluster in the axils of the leaves and usually concealed by the large stipules; bracts lanceolate to linear, acuminate, hirsute, ciliate, up to an inch long; calyx hirsute, the lobes hirsute-ciliate, up to 5 lin. long.

Hab.—Tenasserim or Andamans.

6. **L. cyanocarpus,** Jack.—An evergreen, low shrub, 2-3 ft. high, all parts covered with dark-brown hairs; stipules lanceolate, hirsute, deciduous; leaves oblong-lanceolate to obovate-oblong and oblong, acute or obtuse at the base, on a short brown-hirsute petiole 2-3 lin. long, shortly and often rather abruptly or long acuminate, entire, chartaceous, above more or less sprinkled with stiff shorter or longer hairs, beneath, especially on the nerves, brown or yellowish pubescent; flowers small, white, sessile, forming dense, large-bracted, sessile, brown-hirsute clusters in the axils of the leaves, the outer bract leafy, up to an inch long or longer, ovate, acuminate, hirsute; calyx hirsute, the lobes linear-subulate, 3-4 lin. long; corolla nearly ½ an in. long, shortly hirsute; drupes oval, the size of a gooseberry, villous, azure blue, sappy, containing usually 4 pyrenes.

Hab.—Rather frequent in the tropical forests of South Andaman; also Chittagong.—Fl. May-June.—s.

GYNOCHTHODES, Bl.

Calyx-limb entire, short, deciduous. Corolla shortly funnel-shaped; tube villous within; limb 4-5-parted, the segments spreading from the middle, with inflexed tips. Stamens 4 or 5, inserted at the base of the corolla; the filaments short; anthers linear.

Ovary crowned by a disk, 4-celled, with a solitary ovule in each cell; stigma 2-cleft, warted, exserted. Berry fleshy, umbilicate, containing 4 (or by abortion 3-2) 1-seeded papery pyrenes.—Climbing shrubs, with twin, interpetiolar, marcescent stipules. Flowers small, in small clusters or rarely solitary, axillary.

1. **G. macrophylla,** Kz.—An evergreen scandent shrub, all parts glabrous, turning blackish in drying; stipules broad and short, truncate, by pairs; leaves elliptical to elliptically oblong, acute at the base, on a ½ an in. long petiole, more or less bluntish-apiculate, 3-5 in. long, entire, pergamaceous, glabrous, beneath with hollow fringed glands in the nerve-axils; flowers small, on thick 2-3 lin. long pedicels, forming by 4-5 a small cluster on a short bracted tubercle-like peduncle; calyx about a line long, glabrous, the tube almost globular; the limb cyathimorph, as long as the tube, truncate; berries globose, the size of a cherry, smooth, sea-green, 4-pyrenous.

Hab.—Amongst shrubbery along the sea-shores of South Andaman.—Fl. May.

VANGUERIA, Comm.

Calyx-tube short, obovate, the limb spreading, 5-toothed, deciduous, rarely persistent. Corolla globular bell-shaped, the throat villous; limb 5-cleft, the lobes recurved. Stamens 5, with very short filaments. Ovary 5-celled, with a solitary ovule in each cell attached to near the middle of the inner angle; style filiform; stigma exserted, mitre-shaped or 5-angular-capitate. Berry succulent, marked by the scar of the calyx-limb, containing 5 or by abortion fewer bony 1-seeded nuts. Seeds oblong. Albumen fleshy. Embryo large; cotyledons long, plano-convex, about as long as the superior radicle.—Small trees or shrubs, with free interpetiolar stipules. Flowers small, in branched axillary cymes or cymose panicles.

* *Unarmed. Stigma mitre-shaped. All parts glabrous.*
* * *Armed with opposite sharp spines* . . . . . *V. edulis.*
All parts glabrous; berries about an inch in diameter; stigma discoid-peltate . . . . . *V. spinosa.*
All softer parts (also the corolla) pubescent; berries up to ½ an inch thick; stigma capitate . . . . . *V. pubescens.*

1. **V. edulis,** Vhl.—A leaf-shedding, unarmed shrub, all parts glabrous; leaves ovate to oblong, shortly acuminate, acute at the base, on a 2-3 lin. long petiole, 3-5 in. long, membranous, entire, glabrous; flowers small, greenish white, on 1-1½ lin. long slender pedicels, forming more or less compound minutely pubescent cymes above the scar of the fallen leaves; calyx minute, the lobes as long as the tube, reflexed; corolla-tube about a line long, the throat woolly; stigma 5-angular-mitre-shaped; berries the size of a large

cherry, globular, and more or less 5-lobed in a dried state, yellowish, smooth, crowned by the scar of the marcescent calyx, containing 5 horny 1-seeded pyrenes.

Hab.—Cultivated in gardens of Chittagong.

2. **V. spinosa,** Roxb.—*Hsay-ma-kyee.*—A leaf-shedding small tree or more usually a much-branched shrub, armed with straight decussately opposite sharp spines, all parts quite glabrous; stipules subulate; leaves elliptically to ovate-oblong, acute at the base, on a 2-4 lin. long glabrous petiole, shortly and more or less abruptly acuminate, 2-3 in. long, entire, membranous, quite glabrous, with a tuft of hairs in the nerve-axils beneath, pale-coloured beneath; flowers small, greenish, on 1½-2 lin. long sparingly pubescent or glabrous pedicels, forming small short clusters or sessile umbellets arising from scared, wart-like, reduced branchlets; calyx glabrous, the lobes lanceolate, acuminate, somewhat longer than the tube; corolla-tube globular, about ½ lin. long, the throat villous; stigma discoid-peltate; berries large, about an inch in diameter, globular, smooth, yellowish, crowned by the scar of the calyx-limb, containing 4 or 5 one-seeded bony pyrenes.

Hab.—Frequent in the mixed dry forests of the Prome district.—Fl. March.—l.—SS.=CaS.

2. **V. pubescens,** Kz.—A tree (20—25+10—15+2—3) leafless during H.S., armed with decussately opposite, straight, sharp spines, all softer parts hirsute-pubescent; bark grey; stipules subulate, pubescent; leaves ovate to elliptically lanceolate, acute or cuneate at the base, on a 2-3 lin. long pubescent petiole, shortly acuminate or acute, 2-3 in. long, entire, membranous, above shortly and scabrously, beneath softly, pubescent; flowers small, greenish, on 2-3 lin. long pubescent pedicels, forming usually small cymes or clusters on wart-like reduced branchlets or in the axils of the leaves; calyx pubescent, the lobes linear; corolla pubescent; stigma capitate; berries the size of a small cherry, ⅓-½ in. thick, smooth, yellowish, containing 5 or 4 bony 1-seeded pyrenes.

Hab.—Rather frequent in the Eng and mixed dry forests from Ava and Martaban down to Pegu. Fl. March-Apr.—l.—SS.=CaS. Lat.

PLECTRONIA, L.

Calyx-tube short, obconical to hemispherical, the limb very short, from truncate to 4-5-toothed, usually deciduous. Corolla with a short tube, the throat bearded, the limb 4-5-lobed. Anthers 4 or 5, inserted in the throat and scarcely exserted. Ovary 2-celled, with a solitary ovule in each cell laterally attached near or at the summit; style exserted; stigma thick-ovoid, mitre-shaped

or discoid, entire or 2-lobed. Drupe compressed or didymous, with 2 or 1 one-seeded pyrenes. Albumen fleshy. Embryo central, the radicle long, superior.—Armed or unarmed shrubs or trees, with free interpetiolar stipules. Flowers small, in axillary cymes or clusters.

* *Unarmed.*

○ Pyrenes quite smooth, triangular, and almost keeled; all parts quite glabrous; flowers in dichotomous elongate-branched cymes . . . . . *P. glabra.*

○ ○ Pyrenes more or less wrinkled and tubercled, rounded on the back.

All parts glabrous and glossy; flowers cymose . . . . *P. didyma.*

Branchlets and nerves pubescent; flowers on capillary pedicels, solitary or by pairs . . . . . *P. gracilipes.*

* * *Armed with usually decussately opposite or rarely ternary sharp spines. Pyrenes more or less wrinkled or tubercled, rounded on the back.*

○ Branchlets more or less rusty- or tawny-pubescent.

Leaves pubescent on both sides or hispid above; drupes the size of a pea . . . . . *P. parvifolia.*

Leaves glabrous or the midrib beneath slightly pubescent; drupes the size of a small cherry . . . . . *P. horrida.*

○ ○ All parts perfectly glabrous.

Leaves glossy, caudate-acuminate; flowers clustered . . . *P. angustifolia.*

Leaves more or less blunt; flowers in peduncled cymes . . *P. parviflora.*

1. **P. glabra,** Bth. and Hf.—An evergreen small unarmed tree, all parts quite glabrous; stipules from a broad base acuminate; leaves ovate-oblong to oblong-lanceolate, tapering in a 3-5 lin. long petiole, shortly acuminate, 4-6 in. long, entire, thin-coriaceous, glabrous, opaque, pale-coloured beneath; flowers small, white, on 1-2 lin. long glabrous pedicels, forming a short-peduncled, axillary, glabrous cyme with elongate dichotomous branchings; calyx obversely turbinate, glabrous, about ½ a line long; corolla-tube almost spherically inflated, about a line long, the lobes about as long, spreading; stigma capitate mitre-shaped; drupes obovate-oblong, ½-⅔ in. long, somewhat notched at the apex, smooth, green, containing 2 smooth 3-angular-keeled ovate pyrenes rather abruptly narrowed and compressed at one end.

Hab.—Tropical forests of the southern spurs of the Pegu Yomah and Tenasserim.—Fr. Jan.—s.—SS.=Lat. p.

2. **P. didyma,** Bth. and Hf.; Bedd. Sylv. Madr., t. 221 (under *Canthium.*)—An evergreen large unarmed shrub growing out into a small tree, all parts quite glabrous and glossy; stipules from a broad base linear, acuminate; leaves from elliptically to oblong-lanceolate, acute at the base and somewhat decurrent on the strong 2-3 lin. long petiole, bluntish acuminate, 2-4 in. long, entire, coriaceous, glossy; flowers small, greenish white, on slender 2-3 lin. long flexuose or curved pedicels, forming a rather short-peduncled (peduncle ½-1 in. long) glabrous cyme in the axils of the leaves;

calyx ½ a line long or somewhat longer, the limb obsoletely toothed; corolla short-funnel-shaped, the tube 1-1½ lin. long; style flexuose, exserted; stigma mitre-shaped; drupes didymous, elliptically obovate, on ½-¾ in. long pedicels, glabrous, the size of a large coffee-bean, crowned by the scar of the calyx-limb, containing 2 or by abortion a solitary wrinkled pyrene.

Hab.—Tenasserim.

3. **P. gracilipes,** Kz.—An unarmed shrub, the young branchlets thinly pubescent; stipules ovate, subulate-acuminate, appressed tawny-pubescent; leaves ovate-oblong to oblong-lanceolate, acute or obtuse at the base, on a thin pubescent petiole 1-2 lin. long, 2-4 in. long, entire, acuminate, membranous, glabrous with the exception of the thinly tawny-pubescent nerves; flowers small, on capillary ½-¾ in. long slightly appressed-pubescent pedicels arising solitary or by pairs from the shortened lateral branchlets; calyx hemispherical, ½ lin. long, glabrous, the teeth triangular; drupes didymously reniform and sinuate at the apex, somewhat compressed, smooth, bluish black, containing 2 or by abortion a solitary slightly tubercled-wrinkled pyrene rounded on the back.

Hab.—Rather frequent in the tropical forests of the Andamans, especially along the western coasts.—Fr. Apr.-May.—s.

4. **P. parvifolia,** Bth. and H.f.—A very rigid spreading shrub, armed with decussately opposite, straight, sharp spines, all softer parts more or less hispid-pubescent; stipules broad, acute; leaves from ovate to oblong and ovate-oblong, on a very short (up to a line long) pubescent petiole or almost sessile, acute at the base, 1½-½ in. long, more or less acute or very shortly acuminate, sometimes even blunt, entire, membranous or rigidly membranous, shortly and rather appressedly hirsute on both sides or sometimes hispid-pubescent above; flowers minute, greenish white, on very short, thick, glabrous pedicels, or almost sessile, solitary, or a few together clustered in the axils of the leaves; calyx obsoletely sinuate-toothed or almost truncate, short, nearly a line in diameter, glabrous; corolla-tube hardly ½ a line long, pubescent within; stigma 2-lobed; drupes didymous, obovate, rather compressed, sinuate at the apex, crowned by the scar of the calyx-limb, the size of a pea, orange-yellow when ripe, almost sessile, containing 2 or by abortion a solitary somewhat tubercled pyrene rounded on the back.

Hab.—Not unfrequent in the low forests and shrubberies above Rangoon; Chittagong.—Fl. R.S.

5. **P. horrida,** Bth. and H.f.—A rigid straggling shrub, armed with decussately opposite, straight, sharp spines, the younger branchlets appressed tawny- or rusty-pubescent; leaves more or less ovate,

rounded at the base, on a slightly pubescent petiole 1-1½ lin. long, 1-1½ in. long, acute, entire, firmly membranous, glabrous or slightly pubescent along the midrib beneath, turning yellowish in drying; flowers minute, white, very shortly pedicelled or almost sessile, solitary or a few together in the axils of the leaves; calyx and corolla as in the preceding species, but the latter pilose within the tube; stigma apparently mitre-shaped; drupes the size of a small cherry, compressed-globular, crowned by the minute calyx-limb, smooth, containing 1 or 2 obsoletely wrinkled pyrenes rounded on the back.

HAB.—Tenasserim.

6. **P. angustifolia,** Bth. and H.f.—A shrub, armed with straight, sharp, opposite spines, all parts glabrous and glossy; stipules from a broad base subulate-acuminate; leaves ovate-lanceolate, more or less rounded at the base, on a 2-3 lin. long slender petiole, bluntish caudate-acuminate, 2-3 in. long, entire, thin coriaceous, glabrous and glossy; flowers small, white, on a line long glabrous pedicels, clustered in the axils of the leaves; calyx glabrous, more than ½ a line long, the limb obsoletely sinuate-toothed; corolla-tube about ½ a line long, inflated, glabrous; stigma 2-lobed-capitate; drupes didymous-cordate, compressed, smooth, crowned by the scar of the calyx-limb, the size of a pea, containing 2 or by abortion a solitary somewhat tubercled-wrinkled pyrene rounded on the back.

HAB.—Hills of Chittagong.—Fl. March-July.

GUETTARDA, L.

Calyx-limb truncate or irregularly toothed; corolla-tube cylindrical, the limb 4- or more-lobed, imbricate. Anthers included in the corolla-tube. Ovary 1-celled, with 4 or more ovules attached to the fleshy central column; style long; stigma conical or capitate, often furrowed. Drupe more or less globular, crowned by the shortly tubular calyx-limb, with 4 or more pyrene-like seeds united into a spuriously-celled woody putamen. Seeds oblong, cylindrical or curved, the testa hard and bony. Albumen none or scanty. Cotyledons not broader than the superior radicle.—Trees or shrubs, with interpetiolar deciduous stipules. Flowers sessile along the branchings of a forked, peduncled, axillary cyme.

1. **G. speciosa,** L.; Bedd. Sylv. Madr. 134-4, t. 17, f. 2.—An evergreen tree (25—30 + 10—15 + 3), the shoots pubescent; stipules ovate, deciduous, pubescent; leaves obovate to broadly obovate and elliptical, rounded or slightly cordate at the base, on a densely puberulous petiole ½-1 in. long, 6-10 in. long, blunt or almost acute,

entire, membranous, almost glabrous above, beneath softly and shortly pubescent; flowers rather conspicuous, white, sessile, forming a tawny-tomentose, dichotomous small cyme on an 1½-3 in. long peduncle arising from the axils of the fallen upper leaves; calyx about 2 lin. long, tawny-velvety tomentose, truncate; corolla pubescent, the tube an inch long, the 7-8 lobes about ⅓ as long; style glabrous, with a conical stigma; drupe the size of a large cherry, almost globular, somewhat lobed, glabrescent, crowned by the calyx-limb, containing a spuriously 4-6-celled woody putamen.

Hab.—Frequent in the beach jungles and tidal forests along the shores of the Andamans.—Fl. Apr.—May.—l.—SS.=Aren. Sal.

POLYPHRAGMON, Desf.

Flowers polygamously dioecious. Calyx-tube ellipsoid or turbinate, the limb 4- or 5-toothed or -lobed, or rarely almost truncate, often unequal. Corolla funnel-shaped with a slender tube, the limb 4- or 5-parted, valvate. Stamens 4 or 5; anthers linear, included in the corolla-tube, the filaments short. Ovary in the males rudimentary, in the hermaphrodites 4-10-celled, with many 2-seriate ovules in each cell; style surrounded at the base by the disk; stigmas as many as ovary-cells. Berry crowned by the calyx-limb, containing numerous pyrene-like seeds closely packed and diverging in many rows from the axis.—Trees or shrubs, with membranous very deciduous stipules. Flowers axillary, the females with small or imperfect stamens, usually solitary or few together, the males by 3 or more in the forkings or along the branchings of peduncled cymes.

1. **P. flavescens,** Kz.—An evergreen small tree, the young shoots sparingly silky-pubescent; stipules lanceolate, pubescent, very deciduous; leaves from oblong-lanceolate to obovate-oblong, tapering in a ½-¾ in. long petiole, 3-5 in. long, entire, shortly acuminate, thin-coriaceous, beneath pale coloured and appressed pubescent along the nerves beneath; flowers small, white, between 2 short bractlets, on 1-1½ lin. long densely puberulous pedicels and sessile in the forks, the males forming a dichotomous, short, puberulous, peduncled cyme in the axils of the leaves, the females solitary on stiff peduncles up to an inch long; calyx puberulous, 5-toothed, about a line long; corolla velvety-pubescent, the lobes more than half as long as the tube, varying in number from 4 to 10; berries almost globular, about ⅓ in. long, crowned by the calyx-limb, indistinctly pubescent.

Hab.—Rather frequent in the tropical forests of the Andamans.—Fl. Apr.-May.—l.—SS.=Aren. Sal.

GARDENIA, L.

Flowers hermaphrodite or polygamously dioecious. Calyx-limb tubular, truncate, toothed or lobed, or divided to the base into 5 or more lobes. Corolla funnel- or bell- or salver-shaped, the limb 5- or more -lobed, imbricate. Anthers nearly sessile, usually more or less exserted. Ovary 1-celled, incompletely divided or lined by 2, 3, or rarely more projecting parietal placentas with several or many ovules to each; style shorter or longer filiform, with as many erect thick stigmatic lobes as placentas or nearly entire. Berry more or less firmly fleshy or almost woody, usually crowned by the calyx-limb, 1-celled, with numerous seeds immersed in the fleshy or pulpy parietal placentas.—Trees or shrubs, usually resin-yielding, with interpetiolar entire stipules more or less connate round the branches and often very deciduous. Flowers often showy, solitary, or by 2-3, rarely in cymes, terminal or spuriously axillary.

* *Randia-like trees or shrubs, armed with opposite sharp spines (abortive branchlets). Stipules free, very deciduous. Flowers small, usually polygamously dioecious.*

× All parts, also the leaves, glabrous; calyx-lobes herbaceous or leafy.

Leaves more or less lanceolate; flowers pedicelled, clustered by 3 or more; calyx about 2 lin. long . . . . . *G. campanulata.*

× × All parts more or less pubescent, villous or tomentose.

○ Fertile flowers sessile, the hermaphrodite sterile ones in cymes; calyx-lobes herbaceous or leafy; corolla green.

Bark grey; fertile and sterile flowers on the same plant; berries plumply beaked, terete . . . . . *G. sessiliflora.*

Bark red; fertile and sterile flowers on separate plants; berries slightly ribbed . . . . . *G. erythroclada.*

○ ○ All flowers fertile, or at least perfectly hermaphrodite; calyx truncate or minutely toothed; corolla not green.

\+ Leaves quite glabrous; berry glabrous.

Calyx puberulous; branches silvery-white; berry smooth . . *G. cuneata.*

\+ \+ Leaves, at least beneath, pubescent to villous.

Calyx puberulous; berry glabrous, rough; branches grey . . *G. turgida.*

Calyx velvety-tomentose; berry densely brown, velvety-tomentose . *G. dasycarpa.*

* * *Unarmed. Stipules connate in a sort of sheath, rarely almost free. Flowers showy, usually large.*

× Stipules more or less united in a sheath; corolla salver-shaped, with a long tube; calyx various.

○ Berries and flowers sessile or nearly so.

Leaves almost sessile, scabrous; berries globular, in the forks of the branchings . . . . . *G. obtusifolia.*

○ ○ Berries and flowers on short (3-5 lin. long) pedicels.

Leaves glabrous with a tuft of hair in the nerve-axils beneath; calyx deeply 5-cleft; berry oblong, terete . . . . *G. resinifera.*

Leaves glabrous; calyx laterally cleft and more or less spathaceous; berry oblong, more or less distinctly ribbed . . *G. coronaria.*

× × Corolla bell- or funnel-shaped, with a ventricose in-

flated tube ; stipules connate or almost free ; leaves glossy.

Tree ; leaves coriaceous, with a gland in the nerve-axils beneath ; flowers very large and showy . . . . . *G. pulcherrima.*

Shrub, 1-3 ft. high ; leaves membranous ; flowers rather small, white . . . . . *G. hygrophila.*

* *Armed with opposite sharp spines ; stipules free, very deciduous ; flowers small.*

1. **G. campanulata,** Roxb.—*Hsay-than-paya.*—A tree (15—20 + 4—5 + ⅓—1), leafless during H.S., rather shrubby and armed more or less with opposite straight spines, all parts glabrous or the leaf-buds pubescent ; stipules deciduous ; leaves lanceolate to ovate-lanceolate, acute at the base, on a slender 1-2 lin. long petiole, 1-2 in. long, bluntish acuminate, entire, membranous, glabrous ; flowers small, white, on slender 1-1½ lin. long glabrous pedicels, forming by 4 or more small clusters at the end of the thick branchlets ; calyx glabrous, bell-shaped, about 2 lin. long, truncate and obsoletely 5-toothed ; corolla glabrous, funnel-shaped, the lobes rounded, shorter than the wide tube ; berry ovoid, the size of a large plum, glabrous.

Hab.—In the tropical forests of Pegu above Rangoon and Tenasserim ; also Chittagong.—s.

2. **G. sessiliflora,** Wall.—*Ma-jee-bouk.*—A tree (15—18 + 2—5 + ⅔—1), shedding leaves in H.S., straggling and often shrubby, armed with strong, opposite, spiny abortive branchlets, all the softer parts pubescent, turning soon roughish puberulous ; stipules free, very deciduous ; leaves cuneate-lanceolate to obovate and elliptically lanceolate, acuminate at the base, on a puberulous petiole 3-4 lin. long, 2-4 in. long, shortly and bluntish acuminate, entire, membranous, shortly pubescent on both sides, turning glabrous above ; flowers greenish, the hermaphrodite ones sessile, terminal, solitary and larger, with a fully developed large ovary, the sterile hermaphrodites by 2-4 on 2 lin. long pubescent pedicels arising from the end of the banchlets or from the axils of the young leaves ; calyx-tube flask-shaped, densely pubescent, 3-4 lin. long, the limb as long or longer than the tube, green, membranous, the lobes somewhat leafy, oblong ; corolla velvety-pubescent outside, the tube hardly longer than the short lobes, wide, little exserted ; berries ovate, upwards tapering in a plump beak crowned by the circular scar of the fallen limb, about 1½ in. long, brown and somewhat rough.

Hab.—Common in the leaf-shedding forests, especially the mixed ones, all over Burma from Ava and Martaban down to Upper Tenasserim, up to 3,000 ft. elevation.—Fl. Apr.-May ; Fr. C. S.—1.—SS = ∞ *SiS. All.*

3. **G. erythroclada,** Kz.—*Mhan-nee.*—A tree (15—25 + 4—6 + 1—2), leafless in H.S., armed with opposite, straight, short spines,

the stem and rigid branches mealy and brick-coloured, very knotty and armed with reduced spiny branchlets, all softer parts shortly pubescent; stipules very deciduous; leaves obovate to cuneate-obovate, at the base often unequally decurrent on a ½-1 in. long pubescent petiole, 4-6 in. long, blunt, entire or nearly so, membranous, pubescent on both sides, more so beneath; flowers greenish, the hermaphrodite fertile ones on separate trees, solitary and sessile or nearly so at the end of the branches, the hermaphrodite sterile ones on long slender pubescent pedicels, forming sessile or shortly-peduncled clusters at the end of the young branchlets or in the axils of the leaves; calyx pubescent, the tube more developed in the fertile flowers, the lobes leafy, obovate, from 4-6 in. long; corolla pubescent, with a short wide tube; berries of fertile flowers sessile, the size of a duck's egg, ovoid, roughish, brown, obscurely ribbed, those of the sterile flowers on 1½-2 in. long, straight, brown-pubescent peduncles, the size of a small cherry, more or less globular, crowned by the large leafy calyx-limb.

Hab.—Common in the mixed and dry forests all over Burma from Ava and Martaban down to Upper Tenasserim.—Fl. Apr.-May; Fr. C.S.—1.—SS.=CaS. *SiS.*—All., etc.

4. **G. cuneata,** R. Br.—A small tree, all parts glabrous, the branches silvery white, sparingly armed with solitary or paired straight, sharp spines; leaves obovate-cuneate, tapering in a short petiole or almost sessile, blunt, 1-2 in. long, entire, thick-coriaceous, smooth, the nerves thin, without visible net-veination between them; flowers rather small, white, turning yellow, on short bracteoled thick pedicels, by 2 or 3 arising from short tubercle-like axillary branchlets; calyx puberulous, 5-toothed, with a pair of minute teeth in each sinus of the linear-lanceolate true teeth; corolla about ⅓ in. across, almost rotate, the tube only as long as the calyx, bearded at the throat, the lobes obovate, blunt; berries globular, the size of a wood-apple, smooth.

Hab.—Ava.—Fr. Sep.

5. **G. turgida,** Roxb.; Bedd. Sylv. Madr. 134-1, t. 15, f. 6; Brand. For. Fl. 270.—*Tha-meng-sa-nee.*—A tree (20—30 + 4—6 + 1—2½), leafless during H.S., the trunk and the branches armed with sharp spines, all softer parts shortly pubescent; bark grey, smooth; stipules deciduous; leaves obovate-cuneate to obovate-lanceolate, tapering on the short petiole or nearly sessile, acute or blunt, 1½-3 in. long, entire or nearly so, almost coriaceous, above minutely puberulous or more or less glabrescent, beneath softly but shortly pubescent; flowers rather small, white, turning yellowish, on very short and thick pedicels, by 2 or 3 or sometimes more from the end of the short thick branchlets; calyx bell-shaped, 2 lin. long, almost

truncate with 5 minute teeth, puberulous; corolla almost salver-shaped, glabrous, the tube about 4 lin. long, the lobes oblong, as long as the tube; berries globular or nearly so, apiculate, corticate, rough, brown, the size of a small apple.

Hab.—Frequent in the Eng and dry forests of Prome, rather rare in the Irawaddi zone.—Fl. March-Apr.; Fr. March of next year.—l.—SS.=*CaS.* Lat. Dil.

6. **G. dasycarpa,** Kz.—A leaf-shedding tree (12—15+3—4+1—1½) armed with opposite, long, straight, sharp spines, all softer parts villous-pubescent; stipules deciduous; leaves obovate-oblong, acute or acuminate at the base, on an 1-2 lin. long petiole, blunt or acute, 1-2 in. long, entire, coriaceous, above minutely retrorse-pubescent, beneath appressed villous-pubescent; flowers sessile, solitary at the end of the thick wart-like branchlets; berries globular, corticate, the size of a small apple, covered with a brown velvety tomentum and crowned by the tubular calyx-limb.

Hab.—Not unfrequent in the mixed dry and Eng forests of Prome; also in Upper Tenasserim.—Fl. March-Apr.; Fr. the following year.—l.—SS.=CaS. Lat.

* * *Unarmed. Stipules connate in a sort of sheath, rarely almost free; flowers showy, large.*

7. **G. obtusifolia,** Roxb.—*Yeng-khat.*—A tree (15—25+4—6+1—2), leafless in H.S., the young shoots minutely puberulous and covered with a sticky resin; bark thin, dark grey, peeling off in thin irregular flakes; stipules connate, sheath-like; leaves obovate-oblong to oblong, acute or obtuse at the base, very shortly petioled or almost sessile, 2½-5 in. long, blunt, entire, thin-chartaceous, scabrous on both sides; flowers showy, white, turning yellow, on short, thick, puberulous pedicels, solitary at the end of the branchlets and on reduced wart-like branchlets in the forks of the branches only (those in the forkings set fruits); calyx about ½ an inch long, the tube oblong, puberulous, tapering at the base, the limb sticky, shortly 5-toothed, the teeth ovate-lanceolate to 3-angular-acute; corolla-tube 1½-2 in. long, the 5 or rarely 4 lobes half as long, obovate-oblong; berries almost globular or somewhat elliptical, the size of a pigeon's egg, nearly sessile, corky-fleshy, lenticellate, brown, crowned by the tubular calyx-limb.

Hab.—Frequent in the Eng and dry forests from Prome and Martaban down to Upper Tenasserim.—Fl. March-Apr.; Fr. the following year.—l.—SS.=CaS. Lat.

Remarks.—Sapwood pale brown, soft. Yields fine pellucid yellow resin.

8. **G. resinifera,** Roth.—A tree (20—25+5—8+1—3), leafless in H.S., the young shoots sticky; stipules connate at the base, smooth; leaves ovate-oblong to elliptically oblong, acute and often

unequal at the base, on a somewhat pubescent petiole 2-3 lin. long, 2-4 in. long, blunt or bluntish, entire, chartaceous, with a tuft of hairs in the axils of the nerves beneath; flowers conspicuous, white, turning yellow, on 3-4 lin. long often somewhat mealy pedicels, arising solitary from the forkings of the last branchings or at the end of the branchlets; calyx about 4 lin. long or longer, glabrous or nearly so, the tube spindle-shaped; limb as long or longer than the tube, deeply 5-cleft, the teeth linear-lanceolate; corolla glabrous, the tube 1-1½ in. long, the 5 lobes half so long, broadly rhomboid-obovate; berries oblong, the size of a pigeon's egg, on a 3-4 lin. long stalk, glabrous, crowned by the calyx-limb.

HAB.—Chittagong.

9. **G. coronaria,** Ham.—*Yeng-khat.*—A tree (25—30+10—15+2—3), leafless during H.S., the young shoots minutely puberulous and covered with a sticky resin; stipules connate, shortly puberulous; leaves obovate to obovate-oblong, tapering in a very short somewhat puberulous petiole, 4-10 in. long, shortly and abruptly acuminate or apiculate, entire or nearly so, chartaceous, a little scabrous beneath; flowers showy, white, turning yellow, on thick 4-5 lin. long shortly puberulous sticky pedicels, arising solitary from the end of the branchlets or laterally from the base of the young shoots; calyx ½ to ¾ in. long, glabrous or puberulous and sticky, laterally cleft and somewhat spathaceous or 2-cleft or irregularly 5-toothed; corolla-tube 1½-2 in. long, the 5 or 6 lobes half as long, rhomboid-obovate; berries the size of a pullet's egg, elliptically to obovoid-oblong, marked by 5-10 longitudinal more or less prominent angles or lines, smooth, beaked and crowned by the calyx-limb.

HAB.—Frequent in the mixed, especially the moister, forests, rare in the low forests, all over Burma from Chittagong, Pegu, and Martaban down to Tenasserim.—Fl. Apr.; Fr. the following year.—l.—SS.=Metam. Arg. SiS., etc.

REMARKS.—Wood pale brown or white, rather heavy, of an unequal fibre, rather brittle, very close-grained. W.=□′=49 pd. Used for making combs and adapted for turning, but cracky.

10. **G. pulcherrima,** Kz.—An evergreen tree (30—35+10—15+3—4), all parts glabrous; stipules broadly triangular, free or nearly so; leaves broadly to oblong-lanceolate and elliptically oblong, acute at the base, on a strong petiole 3-4 lin. long, 3-5 in. long, shortly acuminate, entire, coriaceous, quite glabrous and shining with a metallic lustre, beneath bearing a gland in the axils of the nerves; flowers large and showy, white, with rose-coloured dots inside, on 2-3 lin. long bracted tomentose pedicels, forming by 3 or more a short-peduncled tawny-tomentose cyme in the forks of the branchlets or spuriously axillary by suppression of one of the 2 branchlets; calyx about 3-3½ lin. long, tomentose, the ample limb 5-toothed, the teeth ovate, acuminate; corolla glabrous, 1½ in.

long or somewhat longer, ventricose-inflated above the very short tube; berries globose, the size of a small orange, corticate and rough, brown, crowned by the calyx-limb.

HAB.—Not unfrequent in the tropical forests of South Andaman.—Fl. May Fr. Apr. of following year.—s.—SS.=chloritic and serpentine rocks.

11. **G. hygrophila,** Kz.—An evergreen small shrub, 1-3 ft. high, often spreading, all parts glabrous or nearly so; stipules connate, glabrous or sparingly hirsute; leaves obovate to obovate and elliptically oblong, acute at the base, on a slender petiole 2-3 lin. long, blunt or acute, 2-2½ in. long, entire, membranous, glabrous, very shining above; flowers middling-sized, white, turning black in drying, almost sessile, solitary at the end of the branchlets or in the upper forkings of the same; calyx glabrous or slightly appressed hairy, nearly 4 lin. long; limb bell-shaped, 5-cleft, the lobes linear-lanceolate, acuminate, sparingly ciliate; corolla about an inch long, somewhat irregularly campanulate-funnel-shaped, the lobes unequal, about ½ an in. long.

HAB.—Frequent in the swamp forests and in swampy places in the savannahs of the Irawaddi alluvium.—Fl. Jan.—s.—SS.=All.

RANDIA, L.

Calyx-tube tubular, bell-shaped or annular, truncate, toothed or lobed, usually persistent. Corolla from salver-shaped to almost rotate, the tube long or short, rarely dilated at the throat, the limb 5-lobed, imbricate. Anthers nearly sessile, included in the tube or exserted. Ovary 2-celled, with several (usually numerous) ovules in each cell attached to a fleshy peltate placenta; style more or less spindle-like thickened at the middle; stigma simple or 2-lobed. Berry succulent, often crowned by the calyx-limb. Seeds immersed in the fleshy or pulpy placentas.—Small trees or shrubs, usually armed with spines (abortive branchlets). Stipules interpetiolar, singly on each side, broad and acuminate, often deciduous. Flowers rather small, rarely large, in axillary cymes or clusters, or solitary at the end of short, often tubercle-like, reduced branchlets.

Leaves glossy, smooth; corolla almost rotate, about 2 in. in diameter; berries large, sessile or peduncled . . . . . *R. uliginosa.*
Leaves glabrous or sparingly hirsute; corolla less than 4 lines in diameter, with a wide glabrous or sparingly hairy tube; berries sessile, glabrous . . . . . *R. longispina.*
As former, but all parts pubescent; berries sessile, tawny-velvety . *R. nutans.*

1. **R. uliginosa,** DC.; Bedd. F. Sylv. Madr. 132, t. 16, f. 1; Brand. For. Fl. 273.—*Mhan-hpyoo.*—An evergreen tree (20—30+4—8+2—3), rigidly branched, armed with geminate, straight, short, but sharp spines especially towards the end of the thick, short

branchlets, all parts glabrous; bark blackish grey or dark brown, rough, irregularly peeling off in little irregular flakes; leaves obovate-oblong to oblong, tapering in a $\frac{1}{2}$-$\frac{3}{4}$ in. long petiole, more or less blunt, 3-6 in. long, entire, firmly membranous, quite glabrous, glossy, pale-coloured beneath; flowers rather large and conspicuous, pure white, solitary, on some trees sessile, on others on rather long and slender pedicels, arising from the end of the scaly, very short, thick branchlets; calyx glabrous, about $\frac{1}{2}$ an in. long, the lobes broad and rounded; corolla almost rotate with a very short tube, pubescent at the throat, the lobes all rounded; berries of two kinds, the sessile ones the size and shape of a hen's egg, smooth, crowned by the calyx-limb, when fully ripe yellow and of an agreeable scent like pears, but leathery-fleshy and insipid, the peduncled ones similar, but about half the size.

HAB.—Common in the savannah forests and in low places inundated during rains, as well in the savannahs as in the lower mixed forests, all over Burma from Ava and Martaban down to Upper Tenasserim.—Fl. Apr.-June; Fr. C.S.—l.—SS.=All.

2. **R. longispina,** DC.—*Hsay-than-paya.*—An evergreen tree (12—20 + 6—12 + $\frac{1}{3}$—$\frac{2}{3}$) or a large shrub, armed with straight, sharp spines, the branches long and slender, spreading, all parts glabrous or rarely sparingly hirsute; leaves cuneate-lanceolate to cuneate-obovate-oblong, tapering in a 1-4 lin. glabrous or puberulous petiole or almost sessile, bluntish acuminate to blunt, mucronate, 1-3 in. long, entire, membranous, glabrous or rarely on both sides shortly and sparingly hirsute; flowers rather small, on very short pubescent or glabrous pedicels or almost sessile, solitary or few together at the end of scaly, very short branchlets; calyx glabrous or nearly so, rarely sparingly hirsute, the lobes leafy, ovate, acute, alternating with as many teeth in the sinuses; corolla appressed-pubescent outside, salver-shaped, the tube as long as the calyx-tube, with a ring of hairs at the middle within; berries ovoid, sessile or nearly so, the size of a pigeon's egg or somewhat larger, obscurely 5-lobed, smooth or sprinkled with a few short hairs, when fully ripe yellow, crowned by the shortly tubular leafy-lobed calyx-limb.

Var. 1, **longispina proper:** all parts, also the calyx, glabrous; fruits glabrous.

Var. 2, **hirsuta:** all softer parts thinly hirsute; berries very sparingly and shortly hirsute.

HAB.—Frequent in the tropical forests of Pegu and Martaban.—Fl. Apr.; Fr. May-July.—s.—SS.=Metam. SiS. All.

3. **R. nutans,** DC.—An evergreen small shrubby tree, all softer parts more or less shortly pubescent, the branches elongate and

slender, armed with straight, sharp, 1-2 in. long, opposite spines; leaves more or less cuneate-obovate and often very narrowly so, tapering into a 1-4 lin. long puberulous petiole, bluntish or acute, mucronate, 2-3 in. long, membranous, entire, on both sides shortly and often roughish puberulous; flowers rather small, pure white, very shortly pedicelled, solitary from very short branchlets or rarely spuriously axillary; calyx-tube densely pubescent or velvety, the lobes ovate, acute, leafy, usually alternating with as many minute teeth in the sinuses; corolla appressed-pubescent outside, salver-shaped, the tube very little longer than the calyx-tube, inflated near the base and inside closed with a ring of hairs; berries elliptically ovoid, the size of a nutmeg, tawny-velvety, crowned by the short calyx-tube with its persistent leafy lobes.

Hab.—Not unfrequent in the tropical and moister upper mixed forests along the base of the Pegu Yomah.—Fl. Apr.-May; Fr.—C.S.—s.—SS.=SiS. All.

4. **R. exaltata,** Griff.—A large tree, 50 ft. high, the younger branchlets compressed, rusty-pubescent; stipules entire, connate at the base, subulate-pointed, rusty-pubescent; leaves crowded at the end of the branchlets, shortly petioled, unequally obovate, shortly and bluntish acuminate, almost repand, along the nerves beneath pubescent; flowers conspicuous, large, white, sweet-scented, on short pubescent pedicels, arranged into almost trichotomous, pubescent, bracted cymes arising from above the scars of the fallen leaves; calyx rusty-pubescent, the tube ovate; limb 5-toothed, the teeth short, acute, erect; corolla funnel-shaped, shortly pubescent outside, the tube very long and amplified below the middle, with a naked throat, the 5 lobes almost equal, ovate-lanceolate, spreading; ovary 2-celled; berry globular, the size of a small apple, 2-celled, crowned by the somewhat obsolete calyx-limb on a conical blunt protuberance, almost woody, many-seeded; seeds compressed angular.

Hab.—Lower Tenasserim, growing with mangroves.—Fl. Fr. January.

WEBERA, Schreb.

Calyx-limb short, truncate or 5-toothed, deciduous. Corolla-tube cylindrical; lobes 5, imbricate and usually twisted. Anthers nearly sessile, more or less exserted. Ovary 2-celled, with several ovules in each cell attached to a peltate placenta; style equally filiform, short or often very elongate, the stigma simple or 2-lobed. Berry globular to elliptical, 2-celled, with several or few (down to 2) angular seeds in each cell. Albumen almost horny.—Trees or shrubs, unarmed, or armed and scandent, with interpetiolar stipules. Flowers usually rather small, in terminal, axillary or leaf-opposed, simple or corymbose cymes.

* *Erect shrubs or trees, unarmed; stigma entire.*
× Cymes or corymbs leaf-opposed.
All parts except the inflorescence glabrous . . . . . *W. oppositifolia.*
×× Cymes terminal or in the forks of the branchings.
All parts, also the inflorescence, quite glabrous . . . . *W. Asiatica.*
Inflorescence pubescent . . . . . *W. glomeriflora.*
** *Shrubs, usually scandent, with curved or straight spines; stigma 2-lobed.*
× Spines recurved.—Scandent shrubs.
○ Inflorescence quite glabrous.
Corolla-tube ¾-1¼ in. long . . . . . *W. longiflora.*
Corolla-tube hardly longer than the calyx, 2 lin. long . . . *W. Siamensis.*
○○ Inflorescence and calyx appressed-pubescent.
Calyx-tube about 3 lin. long . . . . . *W. bispinosa.*
×× Spines straight.—Erect or straggling shrubs.
Flowers sessile or nearly so, between 2 connate bractlets . . *W. fasciculata.*
Flowers solitary, on slender not bracted pedicels . . . . *W. myrtifolia.*

* *Stigma entire.—Erect shrubs or trees, unarmed.*

1. **W. oppositifolia,** Roxb.—An evergreen tree (30—40 + 15—20 + 2—3), flowering already while still a shrub, all parts glabrous; bark about ¼ in. thick, greyish brown, even, finely fissured; cut greenish brown; stipules triangular, acuminate, persistent; leaves oblong to broadly lanceolate, acute at the base, on a 2-3 lin. long petiole, shortly acuminate, 4-6 in. long, entire, thin-coriaceous, glabrous, turning brownish in drying; flowers rather small, whitish, on very short minutely pubescent bracted pedicels, forming brachiate, shortly pubescent, short-peduncled or almost sessile cymes or corymbs arising from opposite the alternately solitary leaves; calyx about 2 lin. long, the tube shortly pubescent, the limb bell-shaped, broadly 5-toothed; corolla-lobes oblong, much longer than the very short tube, densely villous at the throat; berries globular to elliptical, the size of a large pea, smooth, crowned by the circular scar of the fallen calyx-limb.

Var. 1, **densiflora:** calyx 2 lin. long or somewhat longer, almost glabrous, the limb more bell-shaped; flowers in shorter cymes; berries the size of a large pea.

Var. 2, **floribunda:** calyx about 1½ lin. long or shorter, densely pubescent, the limb shorter; flowers in densely pubescent, divaricate, slender, corymbose cymes; berries half the size of the former.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and Martaban down to Tenasserim and the Andamans; also Chittagong; var. 2: Andamans.—Fl. Apr.-June; Fr. Oct.—s.—SS.=SiS.—*Metam.*

Remarks.—Wood yellowish white, turning brown, heavy, very close-grained and of a very fine grain.

2. **W. glomeriflora,** Kz.—An evergreen tree (20—30 + 8—10 + 2—3), all parts glabrous or the leaf-buds pubescent; stipules deciduous; leaves obovate- to elliptically-lanceolate, acuminate at

the base, on a glabrous petiole 2-4 lin. long, 3-4 in. long, acute or apiculate, entire, firmly membranous, glabrous, strongly nerved; flowers almost sessile, densely crowded into a terminal, almost sessile, pubescent cyme; calyx pubescent; berries globular or ovoid, the size of a small pea, on about a line long pedicels, smooth, black, crowned by the base of the calyx-limb.

Hab.—Rare along choungs in the tropical forests of the Pegu Yomah, north of the Kambala toung.—Fl. buds Feb.; Fr. Feb.

* * *Stigma 2-lobed.—Usually scandent spiny shrubs.*

4. **W. longiflora** (*Griffithia longiflora*, Lamk.).—An evergreen large scandent shrub, armed with opposite, sharp, curved spines, all parts glabrous; stipules deciduous; leaves from elliptically to obovate-oblong and oblong-lanceolate, acute at the base, on a 3-5 lin. long petiole, 3-6 in. long, shortly and rather abruptly (often bluntish) acuminate, mucronate, entire, thin-coriaceous, quite glabrous; flowers rather conspicuous, white, on thick 1-2 lin. long pedicels, arising solitary or by threes from the opposite, scale-like, cymbiform-connate bractlets and forming a short-peduncled quite glabrous robust cyme in the axils of the leaves or in the forks or at the end of the branchlets; calyx 2-3 lin. long, tapering in the pedicel, quite glabrous or somewhat pruinous, the limb tubular bell-shaped, the lobes short, triangular, acute; corolla glabrous, the tube slightly pubescent within, $\frac{3}{4}$-$1\frac{1}{4}$ in. long, the lobes about $\frac{1}{3}$ as long; berries ovoid-oblong, about $\frac{1}{3}$-$\frac{1}{2}$ in. long, tapering in a 1-3 lin. long stalk, umbonate and crowned by the circular scar of the fallen calyx-limb, glabrous, many-seeded.

Hab.—Rather frequent in the tropical forests of the Andamans and Tenasserim; also Chittagong.—Fl. March-May; Fr. June-July.—s : l.

4. **W. Siamensis** (*Griffithia Siamensis*, Miq.).—An evergreen large scandent shrub, armed with opposite, recurved, sharp spines, all parts glabrous; stipules deciduous; leaves oblong to oblong-lanceolate, obliquely acute at the base, on a 3-5 lin. long petiole, 3-5 in. long, bluntish, with or without a mucro, entire, thin-coriaceous, glabrous; flowers rather small, white, almost sessile, or the median one of the 3 flowers in the cymbiform-connate bractlets pedicelled, forming a quite glabrous short cyme on the reduced branchlets opposite to the alternately solitary leaves or arising from the fork of the branchings; calyx about 2 lin. long, quite glabrous, tapering at the base, the tube bell-shaped and rather ample, the teeth very short, 3-angular, acute; corolla glabrous, the tube about 2 lin. long, somewhat dilated at the slightly exserted upper end, the lobes oblong, somewhat longer than the tube; stigmatic lobes elongate.

Hab.—Upper Tenasserim.—Fl. March.—s : l.

5. **W. bispinosa** (*Stylocoryne bispinosa*, Griff.).—An evergreen large scandent shrub, armed with short, opposite, recurved, sharp spines, all parts glabrous; stipules 3-angular, deciduous; leaves lanceolate to ovate-lanceolate, acute or acuminate at the base, on a 3-5 lin. long petiole, 3-4 in. long, longer or shorter acuminate, entire, thin-coriaceous, glabrous; flowers rather conspicuous, white, on about a line long appressed tawny or yellowish pubescent pedicels, arising solitary or by 2-3 from the cymbiform-connate bractlets and forming a short more or less densely and shortly appressed-pubescent cyme at the end of the branchlets or spuriously axillary or in the forks of the branchings; calyx more than 2 lin. long, appressed yellowish pubescent, tapering into the pedicel, the limb tubular bell-shaped, the teeth short, 3-angular, acute; corolla glabrous, the tube about 3 lin. long, slender, pubescent inside, the lobes obovate-oblong, nearly as long as the tube; stigmatic lobes elongate.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and Martaban down to Tenasserim.—Fl. Apr.-May.—s : l.

6. **W. fasciculata** (*Posoqueria fasciculata*, Roxb.).—A large straggling shrub, armed with opposite, straight, sharp spines, the younger shoots and often also the branchlets shortly pubescent; stipules from a broad base subulate-acuminate, deciduous; leaves more or less ovate to ovate-lanceolate, shortly and rather abruptly acuminate, rounded at the base, on a 1-2 lin. long, slender, puberulous petiole, 1-2 in. long, entire, firmly membranous, glabrous or shortly pubescent, on the midrib beneath; flowers rather large, white, arising from between 2 connate bractlets and by 3 or more fascicled or also solitary and almost sessile in the axils of the leaves; calyx 3 lin. long, pubescent, the lobes subulate-acuminate; corolla-tube about $\frac{3}{4}$ in. long, the lobes somewhat less than half as long; berries globular, glabrous, the size of a pea, crowned by the circular base of the fallen calyx-limb.

Hab.—Upper Tenasserim.

7. **W. myrtifolia** (*Gardenia myrtifolia*, Wall.).—An evergreen tree (15—20 + 2—4 + 1—$1\frac{1}{2}$), often shrubby, armed with opposite, short, sharp spines, the young shoots minutely pubescent; stipules deciduous; leaves more or less ovate-lanceolate to oblong, acute at the base, on a very short, slender, puberulous petiole, rather blunt with a minute mucro, $\frac{1}{2}$-$1\frac{1}{2}$ in. long, entire, firmly membranous, glabrous or slightly pubescent along the nerves beneath; flowers rather small, white, on slender, puberulous, not bracted pedicels arising solitary from the axils of the leaves; calyx puberulous, about 2 lin. long, the lobes short; corolla-tube $\frac{3}{4}$ in. long, rather slender, the lobes only about 1-$1\frac{1}{2}$ lin. long.

Hab.—Frequent in the swamp forests of Pegu; Upper Tenasserim.—Fl. May.—s. × l.—SS.=*All.*

DIPLOSPORA, DC.

Calyx-tube short, 4-toothed or truncate. Corolla-tube short, the 4 lobes spreading, imbricate. Anthers exserted. Ovary 2-celled, with 2-10 ovules in each cell attached to small peltate placentas; style with 2 stigmatic lobes. Berry globular or elliptical. Seeds 2-10, or by abortion solitary, imbricate, albuminous.—Trees or shrubs, with interpetiolar, broad, acuminate stipules. Flowers small in axillary clusters or close cymes, or in terminal racemose cymes.

1. **D. singularis,** Korth.—An evergreen tree (50—60 + 20—25 + 4—6), the stem fluted, all parts glabrous; bark about 2 lin. thick, fibrous, longitudinally fissured, brownish grey; cut dry, pale-coloured; stipules triangular, acuminate, glabrous; leaves from broadly to oblong- and elliptically-lanceolate, acute at the base, on a 3-5 lin. long petiole, 3-6 in. long, shortly acuminate, entire, thin-coriaceous, glabrous; flowers small, greenish white, often polygamous, sessile on a very short, thick, broadly bracted, glabrous rachis, or more usually in dense clusters arising solitary from the axils of the leaves; calyx about a line long, glabrous, almost truncate, the teeth minute; corolla glabrous, the tube hardly a line long, bearded at the throat, the lobes elliptically oblong, a line long; berries more or less globular, the size of a cherry or larger, fleshy, purplish black when fully ripe, glabrous, crowned by the short calyx-limb, containing 8-10, flat, imbricated seeds in each cell.

Hab.—Not unfrequent in the tropical forests of Martaban down to Tenasserim, less frequent in those along the eastern slopes of the Pegu Yomah.—Fr. Apr.-May.—s.—SS.=Metam. SiS.

Remarks.—Wood pale brown.

HYPOBATHRUM, Bl.

Calyx-tube short, turbinate or ovoid, the limb 4-lobed or -toothed, persistent. Corolla funnel- or salver-shaped, with a short tube, the 4 lobes twisted-imbricate. Stamens 4, inserted at the hairy throat, included or exserted. Disk various. Ovary 2-celled, with 2-8 pendulous ovules in each cell; style filiform, with a 2-parted or 2-lobed stigma. Berry small, 2-celled, with few pendulous seeds in each cell. Albumen fleshy.—Trees or shrubs, with persistent, interpetiolar, entire stipules. Flowers small, collected into small, dense, sessile clusters or spikes in the axils of the leaves.

Flowers in dense clusters; berries sessile . . . . . *H. strictum.*
Flowers in spike-like racemes; berries stalked . . . . *H. racemosum.*

1. **H. strictum** (*Hyptianthera stricta,* W A.; Brand. For. Fl. 274). —An evergreen branched shrub, 3-6 ft. high, all parts quite glabrous; stipules triangular, acuminate, indistinctly appressed-pubes-

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cent; leaves from lanceolate and linear-lanceolate to broadly and oblong-lanceolate, acute at the base, on a 2-3 lin. long petiole, 3-4 in. long, acuminate, entire, thin-coriaceous, glabrous; flowers small, whitish, almost sessile, in dense, small, axillary clusters; calyx glabrous, the teeth lanceolate, acuminate; corolla pubescent at the throat; stigmas villous; berry globular to ovoid, the size of a pea, smooth, crowned by the calyx-limb.

Hab.—Chittagong and Ava.—Fl. Sep.; Fr. Feb.

2. **H. racemosum** (*Randia racemosa*, Roxb.).—An evergreen bushy shrub, 3-8 ft. high, all parts glabrous; leaves from oblong-lanceolate to lanceolate, tapering into a 1-2 lin. long petiole, shortly and rather abruptly acuminate, entire, coriaceous, glabrous; flowers small, white, supported by a bract, almost sessile, arranged in 2 to 4 rows along a shorter or longer shortly and stoutly peduncled glabrous rachis arising solitary from the axils of the leaves; calyx-teeth 3-angular, acute, nearly a line long; corolla twice as long, villous at the throat; style sparingly pilose; berries elliptical to ovoid, at the base contracted into a 1-2 lin. long stalk, the size of a pea, smooth, crowned by the minute calyx-limb.

Hab.—Not unfrequent in the swamp forests and in somewhat swampy places of Pegu and Arracan.—Fl. Oct.-Dec.; Fr. Dec.-Apr.—l ×s.—SS.=*All.* Dil.

BRACHYTOME, H.f.

Flowers polygamously dioecious. Calyx-tube oblong, the limb cup-shaped, obscurely 5-toothed. Corolla tubular-funnel-shaped (in the males shorter), quite glabrous, 5-lobed, twisted in bud. Anthers 5, almost sessile, inserted to the throat of the corolla, in the males very imperfect. Disk annular or cupular. Ovary 2-celled, with very numerous ovules attached to the peltate placenta. Berry small, 2-celled, many-seeded, not pulpy; seeds horizontal. Albumen fleshy.—Shrubs, with persistent interpetiolar entire stipules. Flowers small, slenderly pedicelled, in axillary or leaf-opposed cymes.

1. **B. Wallichii**, H.f.—An evergreen shrub or small tree, all parts glabrous; stipules from a broad base subulate-acuminate; leaves oblong- to obovate-lanceolate, acute at the base, on a slender petiole 3-4 lin. long, rather abruptly acuminate, membranous, 4-9 in. long, glabrous; flowers rather small, white, on slender 2-3 lin. long pedicels, forming slender, short-peduncled, glabrous, lax, dichotomous cymes in the axils of the leaves or opposite to them; male corolla 2 lin. long, that of the females nearly doubly longer; calyx glabrous, the limb cupular, persistent; berries long and slenderly peduncled, elliptical, the size of a small pea, glabrous, crowned by the shallowly cupular calyx-limb.

Hab.—Ava hills.—Fl. March.

MORINDOPSIS, H.f.

Flowers dioecious. Calyx-tube hemispherical or cupular, the limb 4-toothed or -lobed, persistent. Corolla shortly bell-shaped, the 4 lobes twisted-imbricate. Stamens 4, inserted at the villous throat, included, in the females sterile. Ovary in males reduced to the style, in the females 2-celled, with numerous ovules in each cell. Berry elongate, coriaceous, 2-celled, many-seeded. Seeds imbricate. —Trees, with short persistent stipules. Flowers small, in small peduncled heads or rarely the female ones solitary.

1. **M. capillaris,** Kz.—An evergreen tree (20—25 + 6—8 + 1—2), all parts quite glabrous and glossy; stipules ovate-lanceolate, acuminate, rigid; leaves lanceolate to oblong-lanceolate and elliptically-oblong, acute at the base, on a very short 1-3 lin. long petiole or almost sessile, more or less acuminate to almost blunt, 3-5 in. long, entire or waved, rigidly but thinly coriaceous, glossy and smooth on both sides; flowers small, white, sessile or nearly so, several or many collected in a small head involucred by a few stiff linear-subulate bracts and resting on a 1-2 in. long, stiff, slender or capillary peduncle upwards gradually thickened and arising solitary from or above the axils of the leaves; calyx about a line in diameter, cup-shaped, 4-toothed, the teeth triangular, ciliolate; corolla shortly salver-shaped, the tube about 1½ lin. long, densely villous at the throat; berries cylindrically elongate, 1-1½ in. long, tapering at both ends, crowned by the calyx-limb, smooth, the numerous imbricate seeds 3-cornered, acuminate at both ends, arranged in a single row in each cell.

Hab.—Frequent in the swamp forests of Pegu and Martaban down to Tenasserim.—Fl. Apr.-May.—s.—SS.=*All.* Metam.

UROPHYLLUM, Jack & Wall.

Flowers by abortion dioecious or monoecious, rarely perfectly hermaphrodite. Calyx-tube ovoid, the limb short, bell-shaped, minutely 5-7-toothed or almost entire. Corolla funnel-shaped, with a shorter or longer tube, bearded at the throat, the limb 5-7-parted, valvate. Stamens 5-7, the filaments very short. Ovary 5-7- or rarely only 2-celled, with numerous ovules in each cell attached to the fleshy placentas; style divided into 5-6- or rarely 2 free or almost connate stigmatic lobes. Berry globular, crowned by the calyx-limb, many-seeded; seeds angular or compressed. Albumen fleshy.—Shrubs or trees, with interpetiolar, simple, more or less persistent stipules. Flowers usually minute, in small axillary clusters, cymes, or corymbs.

* *Ovary and berry 5-6-celled; flowers in shorter or longer simple or decompound umbellets or cymes.*

Leaves and shoots glabrous; calyx about 2 lin. across . . . *U. glabrum.*

Leaves beneath and shoots more or less pubescent; calyx a line across . . . . . *U. strigosum.*

* * *Ovary and berry 2-celled; flowers minute, in sessile clusters.* All parts glabrous . . . . . *U. biloculare.*

1. **U. glabrum,** Jack.—A dioecious shrub or little tree, all parts glabrous except the pubescent leaf-buds; stipules linear-oblong, slightly pubescent; leaves elliptically oblong or oblong, acute at the base, on a glabrous petiole $\frac{1}{2}$-$\frac{3}{4}$ in. long, 5-6 in. long, abruptly and bluntish acuminate, entire, chartaceous, glabrous; flowers small, white, on hardly a line long puberulous pedicels, forming short-peduncled minutely involucrated puberulous umbellets arising solitary or by pairs from the axils of the leaves; involucre-bracts about a line long, pubescent; calyx truncate, nearly 2 lin. in diameter; berries the size of a pepper-kernel, broadly globular, smooth, truncate and crowned by the somewhat 5-angular entire calyx-limb.

Hab.—Southern Tenasserim.

2. **U. strigosum,** Korth.—An evergreen large shrub growing out into a little tree, the young shoots sparingly villous-pubescent; stipules linear-lanceolate, appressed-villous; leaves oblong to oblong-lanceolate, acute at the base, on a pubescent petiole $\frac{1}{2}$-1 in. long, 5-7 in. long, rather abruptly and bluntish acuminate, entire, thin-chartaceous, above on the midrib and beneath all over (but chiefly on the nerves) thinly pubescent; flowers small, white, on $\frac{1}{2}$ lin. long pubescent pedicels, usually collected into a solitary, very short peduncled, rather contracted, more or less pubescent involucred umbellet in the axils of the leaves; bracts ovate, a line long, hirsute-pubescent; calyx truncate, a line across, puberulous; corolla villous at the throat.

Hab.—Tenasserim.

3. **U. biloculare,** Kz.—An evergreen tree(25—30+10—15+2—2$\frac{1}{2}$), all parts glabrous; stipules from a broad base subulate-acuminate, sparingly appressed pubescent; leaves oblong-lanceolate to broad-lanceolate, acuminate at the base, on a 1-2 lin. long petiole, bluntish acuminate, 4-5 in. long, entire, chartaceous, glabrous; flowers minute, sessile, in small axillary clusters; calyx (in bud) truncate, minutely puberulous; berries globular, the size of a small pea, obscurely 2-lobed, orange-coloured, crowned by the short calyx-limb, 2-celled, each cell containing 3-4 black largish seeds attached to the central placenta.

Hab.—Very rare in the tropical forests of Martaban, east of Tounghoo, at 2,000 to 3,000 ft. elevation.—Fr. March.—s.—SS.=Metam.

ADENOSACME, Wall.

Calyx-tube shortly turbinate to obversely oblong, the limb 5- or rarely 4-cleft, erect and persistent; corolla salver-shaped, the tube longer or shorter, the limb 5- or 4-parted, valvate. Anthers 5 or 4, almost sessile, inserted at the upper part of the tube and included. Ovary 2-celled, with several ovules in each cell attached to the thick placentas; style rather shorter than the tube, with 2 elongate stigmatic lobes. Berry spongy-fleshy, usually snow-white or purplish, crowned by the calyx-limb, many-seeded, the endocarp and septum chartaceous. Albumen copious.—Shrubs or undershrubs, with simple, free, more or less persistent stipules. Flowers small, in dichotomously branched cymes or corymbs at the end of the branches or in the axils of the upper leaves, rarely laterally from above the scars of the fallen leaves.

1. **A. longifolia,** Wall.—An evergreen branched shrub, 3-4 ft. high, the branches white, the young branchlets appressed-pubescent; stipules oblong, blunt, puberulous; leaves from lanceolate to broadly and obovate-lanceolate, acuminate at both ends, on a puberulous petiole 3-5 lin. long, 5-7 in. long, entire, firmly membranous, above sprinkled with minute appressed hairs, beneath, especially along the nerves, slightly pubescent and glabrescent or pubescent; flowers small, yellow, on 2-3 lin. long pedicels, forming a divaricate, trichotomous, small bracted, more or less puberulous corymb-like cyme at the end of the branchlets or from above the scars of the fallen leaves; calyx obversely turbinate, glabrous or puberulous, the lobes nearly a line long, lanceolate, acuminate; corolla tubular, ½ in. long, the lobes very short; berries almost globular and slightly lobed, spongy-fleshy, watery-white, smooth or nearly so, the size of a pea, crowned by the calyx-limb.

Hab.—Rare in the tropical forests of the southern and eastern slopes of the Pegu Yomah, more frequent in those of the Martaban hills down to Tenasserim, up to 3,000 ft. elevation.—Fr. Jan.-Mar.—s.

MYRIONEURON, R. Br.

Calyx-tube ovoid, the 5-lobes elongate, rigid, persistent. Corolla tubular, villous at the throat, the limb 5-lobed, valvate in bud. Stamens 5, inserted in the corolla-tube, included; filaments short; disk cushion-like. Ovary 2-celled, with very numerous ovules attached to the septal placentas; style rather short, coherent-2-lobed. Berry dry or somewhat fleshy, crowned by the long calyx-lobes, 2-coccous, the cocci horny and slowly dehiscent, many-seeded. Albumen fleshy.—Shrubs, with spongy bark; stipules interpetiolar, large. Flowers small, in terminal loose or compact erect

or nodding cymes, much intermixed with conspicuous often rigid bracts.

Cymes compact, nodding, the bracts subulate, stiff and rigid . *M. nutans.*
Cymes corymb-like, erect, hirsute, the bracts broad and hirsute, soft . . . . . *M. hirsutum.*

1. **M. nutans,** R. Br.—An ascending shrub or rather undershrub of several feet, all parts glabrous; stipules ½ an in. long or longer, lanceolate, dry, glabrous; leaves elliptically ovate to obovate, decurrent at the rounded base into a strong petiole up to an inch long, acuminate, harshly chartaceous, glabrous, ½-¾ ft. long, the lateral nerves numerous, regular and prominent; flowers small, white, shortly pedicelled, crowded and collected into a head-like glabrous short-peduncled nodding cyme at the end of the branches which is supported by floral leaves and densely bracted; bracts stiff and scarious, ovate-lanceolate to linear subulate, about 4 lin. long, striate; calyx-lobes rigid and striate, 3-3½ lin. long, linear, subulate-acuminate, glabrous; corolla shorter than the calyx-lobes or rarely as long; berries ovoid, glabrous, crowned by the very long scarious calyx-lobes.

Hab.—Chittagong.—Fr. Jan.

2. **M. hirsutum,** Kz.—A stout undershrub, all softer parts brownish hirsute; stipules hirsute, linear-lanceolate, thick-membranous, about an in. long; leaves elliptically oblong, acute at the base, on a hirsute petiole up to ½ in. long, acuminate, membranous, ½-1 ft. long, glabrous above, roughish pubescent beneath, the numerous nerves regular and rather prominent; flowers rather small, on slender pubescent pedicels up to ⅓ in. long, forming a rather large, trichotomous, brownish-hirsute, corymbose cyme at the end of the stout branches; bracts pubescent, the lowermost ones conform to the stipules, the others ovate, ½ in. long, acuminate; bractlets lanceolate to linear-lanceolate, subulate-acuminate; calyx hirsute, the lobes subulate, not very stiff, about 2½ lin. long; corolla as long or a little longer than the calycine lobes, tubular-funnel-shaped, sparingly hirsute outside; ovary 2-celled.

Hab.—Ava hills.—Fl. May.

MUSSÆNDA, L.

Calyx-tube oblong-turbinate; limb 5-cleft or -parted, the lobes deciduous or rarely persistent, one of them in a few of the flowers of each corymb enlarged in a membranous usually pure white or pale-coloured large leaf. Corolla funnel- or almost salver-shaped, hairy at the throat, the tube often slender; limb 5-parted, imbricate. Anthers 5, sessile in the throat and included or nearly so. Ovary

2- celled, with many ovules in each cell attached to a 2-cleft placenta projecting from the partition; styles with 2 stigmatic lobes. Berry fleshy, indehiscent, 2-celled, many-seeded. Albumen fleshy.—Small trees or shrubs, sometimes scandent, with interpetiolar stipules often at the base 2-cleft or -parted. Flowers rather small, but gaudy-coloured, in terminal corymb-like cymes.

* *Calyx-limb deciduous, leaving an annular disk on the apex of the berry.*

○ Calyx-teeth ½-1 lin. long.

Calyx-teeth erect, lanceolate; branchlets puberulous or velvety . *M. glabra.*

Calyx-teeth as in preceding, but reflexed; branchlets hirsute . *M. variolosa.*

○ ○ Calyx-lobes 2-6 lin. long.

Calyx-lobes filiform, 2-2½ lin. long, all equal, none leaf-like expanded . . . . . *M. pavettæfolia.*

Calyx-lobes linear, 2 3 lin. long; corolla-lobes nearly half as long as the corolla-tube . . . . . *M. macrophylla.*

Calyx-lobes lanceolate, about ½ in. long; corolla-lobes about ¼ as long as the tube . . . . . *M. calycina.*

* * *Calyx-limb persistent, crowning the berry.*

Calyx-teeth linear-subulate, about 4 lin. long; corymbs rather compact . . . . . *M. corymbosa.*

1. **M. glabra,** Vhl.—An evergreen, large, almost scandent shrub often growing out into a little tree of 12 to 15 ft. high, the young shoots more or less rusty puberulous; stipules triangular, acute, appressed rusty pubescent; leaves from ovate- to broadly lanceolate, more or less acute at the base, on a ⅓-½ in. long petiole, 3-4 in. long, acuminate, entire, firmly membranous, glabrous, or while young slightly appressed-pubescent; flowers rather small, orange-coloured, almost sessile, forming terminal shortly brownish-pubescent terminal corymbs; calyx rusty-pubescent, about 2 lin. long, the lobes lanceolate, about ½ a line long or somewhat longer, the calycine floral leaves white, oval, bluntish, contracted in a shortly pubescent stalk ½ an in. long; corolla tubular-funnel-shaped, about 5-6 lin. long, pubescent, the lobes ovate, acute, a line long; berries ovoid-elliptical, the size of a pea, glabrous, marked by the circular scar of the fallen calyx-limb.

Var. 1, **glabra proper:** more glabrous, especially the leaves and stems.

Var. 2, **Wallichii** (*M. Wallichii,* G. Don.): leaves pubescent beneath and also along the nerves above; petioles shorter.

Hab.—In the drier hill forests of the Martaban hills, at 3,000 to 4,000 ft. elevation.—Fl. Fr. March.—s. + l.—SS. = Metam.

2. **M. variolosa,** Wall.—An evergreen, large, scandent shrub, the branchlets hispid from spreading brown stiff hairs; stipules hispid; leaves oblong-lanceolate to lanceolate, acuminate or obtuse at the base, on a brown-hispid petiole 1-2 lin. long, 3-4 in. long, falcate-acuminate, firmly membranous, entire, above sparingly, beneath,

especially along the nerves, more copiously, covered with short, stiff, brown or rusty-coloured hairs; flowers orange-red, rather small, sessile or nearly so, forming a rusty-pubescent or almost hispid terminal corymb; calyx about 2 lin. long, more or less appressed-hispid, the teeth lanceolate, nearly a line long, reflexed, the calycine floral leaves white, broadly elliptical to oval, somewhat pubescent, contracted into a pubescent stalk up to an inch long; corolla tubular funnel-shaped, an inch long, pubescent, the lobes ovate, acute, about a line long; berries oblong, the size of a pea, glabrous or nearly so, marked by the annular scar of the fallen calyx-limb.

Hab.—In the tropical forests of Arracan and the southern slopes of the Pegu Yomah down to Tenasserim.—Fl. Sep. Feb.—s.

3. **M. pavettæfolia,** Kz.—An evergreen, large, scandent shrub, all softer parts shortly puberulous; stipules ovate, acuminate, pubescent at the base; leaves obovate-oblong to oblong-lanceolate, acute at the base, on a pubescent petiole 2-5 lin. long, acuminate, 6-9 in. long, membranous, entire, on both sides (more so beneath) minutely pubescent; flowers (in bud only) on 1-2 lin. long tawny-pubescent pedicels, forming a dichotomously branched, pubescent, very short-peduncled, corymbose cyme at the end of the branchlets and occasionally in their forks; calyx tawny-pubescent, the tube nearly a line long, the 6 lobes filiform, 2-2½ lin. long; corolla, especially on the tube outside, pubescent.

Hab.—Not unfrequent in the tropical forests of Martaban east of Tounghoo. —Fl. June (?)—s.—SS.=Metam.

4. **M. macrophylla,** Wall.—An evergreen large shrub, growing out into a little tree (15—25 + 4—9 + 1—1½), the young branchlets more or less hirsute; stipules lanceolate to ovate-lanceolate, appressed stiff-hairy; leaves more or less ovate to elliptically lanceolate, acute at the base, on about ½ in. long petiole, 3-5 in. long, shortly and rather abruptly acuminate, entire, membranous, more or less hirsute along the nerves beneath, or almost glabrous; flowers rather large, orange-coloured, almost sessile or shortly pedicelled, forming a terminal hirsute-pubescent corymb; calyx appressed-hirsute, the tube about 1-1¼ lin. long, the lobes 2-3 lin. long, ciliate, the calycine floral leaves white, slightly and minutely pubescent, ovate, acuminate, contracted into a ½-1 in. long stalk; corolla tubular funnel-shaped, the tube hardly an inch long, hirsute, the limb more than ½ an inch in diameter, the lobes broadly ovate, apiculate, nearly half as long as the tube; berries elliptically oblong, the size of a large pea, smooth, marked by the annular scar of the fallen calyx-limb.

Hab.—Common in the tropical and moister upper mixed forests of the Andamans, especially along the coast.—Fl. May-June; Fr. June.—s.

5. **M. calycina,** Wall.—An evergreen, large, scandent shrub, 5-12 ft. high, more or less appressed-pubescent; stipules triangular-lanceolate, pubescent; leaves more or less ovate to elliptically oblong, tapering at the base, on a 3-4 lin. long petiole, 3-4 in. long, acuminate, entire, firmly membranous, above sprinkled with minute appressed hairs, beneath, especially along the nerves, more or less pubescent; flowers rather small, orange-coloured, shortly pedicelled, forming an appressed-pubescent terminal corymb; calyx pubescent, the tube about 2 lin. long or longer, the lobes lanceolate, acute, 4-6 lin. long; corolla tubular-funnel-shaped, the tube about an inch long, appressed-hirsute, the lobes rounded, apiculate, about $\frac{1}{4}$ in. long; berries obversely ovoid, the size of a pea, glabrous, marked by the annular scar of the fallen calyx-limb.

Hab.—Not uncommon in the mixed dry and upper mixed forests, especially along choungs, from Ava and Prome down to Pegu.

6. **M. corymbosa,** Roxb.—An evergreen shrub, the young shoots sparingly appressed pubescent; stipules triangular-lanceolate; leaves oblong- to ovate-lanceolate, acuminate at the base and tapering into a $\frac{1}{2}$-$\frac{3}{4}$ in. long petiole, 3-6 in. long, shortly acuminate, entire, firmly membranous, glabrous or sparingly appressed pubescent on the nerves beneath; flowers rather large, orange-coloured, sessile or nearly so, forming a rather compact, more or less pubescent corymb at the end of the branchlets; calyx more or less appressed stiff-hairy, 4 lin. long or longer, the teeth linear-subulate, 2-2$\frac{1}{2}$ lin. long, persistent; corolla tubular-funnel-shaped, 1-1$\frac{1}{4}$ in. long, appressed hairy, the lobes 2 lin. long, lanceolate, acuminate; berries elliptical, the size of a large pea, smooth, crowned by the long subulate calyx-teeth.

Hab.—Not unfrequent in the upper mixed forests, especially the moister ones, of the Kolodyne district, Arracan; also Upper Tenasserim.—Fr. Oct.—s.—SS.=SiS.

MORINDA, L.

Calyx-limb short, hardly toothed. Corolla funnel- or salver-shaped, with a longer or shorter tube, the limb 5- or rarely 4-6-parted, valvate. Anthers included in the tube or rarely exserted. Ovary 2- or more or less completely 4-celled, the cells with a solitary ovule attached laterally at the base or below the middle; style exserted, with 2 stigmatic lobes, rarely entire. Fruits of each head united into a compound, succulent, syncarpous berry enclosing a number of hard one-seeded pyrenes, usually by 2-4 proceeding from each flower.—Small trees or shrubs, sometimes scandent, with usually membranous interpetiolar stipules united into a short

sheath. Flowers usually several together, and united into small heads on axillary or terminal solitary or clustered peduncles.

* *Corolla-limb* 5- *or rarely* 6-*lobed; stamens* 5-6.—*Erect shrubs or trees.*

○ Stamens exserted.

All parts glabrous; flower-heads on short leaf-opposed peduncles . *M. exserta.*

○ ○ Stamens included in the bud.

× All parts more or less tomentose or pubescent.

All parts shortly and roughish pubescent; corolla glabrous . . *M. leiantha.*

All parts, also the corolla, softly and shortly pubescent . . . *M. tomentosa.*

× × All parts, also the corolla, glabrous.

§ Flower-heads longer or shorter-peduncled, solitary and leaf-opposed.

Stipules rounded or blunt; corolla-throat hairy; berries united in a whitish syncarp . . . . . *M. citrifolia.*

Stipules acute or acuminate; corolla-throat smooth; berries purplish black, only a few developed on the thick torus . . *M. angustifolia.*

§ § Flower-heads sessile or nearly so, leaf-opposed.

Low shrub, quite glabrous or minutely scabrous . . . . *M. persicæfolia.*

§ § § Flower-heads in a peduncled terminal cyme.

Corolla-tube only ¼ in. long, lobes as long . . . . . *M. Wallichii.*

* * *Corolla-limb* 4-*parted; stamens* 4.—*Scandent shrubs.*

○ Calyx truncate.

Flower-heads peduncled, in terminal umbels; peduncles sparingly pubescent, other parts glabrous . . . . . *M. umbellata.*

○ ○ Calyx 4-toothed. All parts glabrous.

Calyx sulcate; flower-heads usually by 3 in a peduncled brachiate terminal corymb . . . . . *M. speciosa.*

* *Corolla-limb* 5- *rarely* 6-*lobed; stamens* 5 *or* 6.—*Erect shrubs or trees.*

1. **M. exserta,** Roxb.; Bedd. Sylv. Madr. 134-9; Brand. For. Fl. 277.—*Nyaw.*—An evergreen tree (25—30 + 6—12 + 3—4), the trunk usually crooked, all parts glabrous; bark deeply cracked, spongy, ash-coloured; leaves from ovate- to elliptically-lanceolate, acuminate or acute at the base, shortly petioled, 3-5 in. long, shortly acuminate, entire, membranous, glabrous; flowers rather small, white, sessile and united into small heads on ½-1 in. long glabrous peduncles arising solitary or rarely by pairs from opposite the leaves; corolla tubular-funnel-shaped, glabrous, the tube ½ an in. long, the lobes half as long, oblong-lanceolate, acute; stamens inserted at the mouth of the corolla, long-exserted; ovary spuriously 4-celled, the style as long as the corolla-tube; berries connate and compound; more or less oval, smooth, each spuriously 4-celled.

Hab.—Burma, no locality given.—Fl. H.S. and R.S.; Fr. the following year.

Remarks.—Wood yellow to red, rather heavy, rather close-grained, hard, takes fine polish. Good for fancy work. Root and bark a red dye.

2. **M. leiantha,** Kz.—A tree (?), all parts shortly and roughish pubescent; stipules ovate-lanceolate, acuminate, scabrous; leaves oblong-lanceolate to lanceolate, acute or acuminate at the base, on a scabrous 1-1½ in. long petiole, 5-8 in. long, acuminate, entire or

nearly so, chartaceous, on both sides (more especially beneath) scabrously and thinly pubescent; flowers white, rather conspicuous, sessile, in small oblong peduncled heads arising solitary or several from the axils of the upper leaves and at the end of the branchlets; calyx truncate; corolla salver-shaped, glabrous, the tube slender, about ¾ in. long, glabrous at the throat, the lobes ovate-lanceolate.

HAB.—Upper Tenasserim.—Fl. Feb.

3. **M. tomentosa,** Heyne.—A leaf-shedding tree (15—20+6—8+1—1½) or large shrub, all parts shortly tomentose or pubescent; stipules broad, acute, pubescent; leaves broadly ovate to ovate-oblong, tapering into a 1-3 lin. long thick tomentose petiole, shortly and often rather abruptly acuminate, 4-7 in. long, entire or nearly so, membranous, softly and shortly pubescent on both sides; flowers pure white, rather conspicuous, sessile and packed into a globular, small, often deciduously bracted head on a ½-1 in. long pubescent peduncle arising solitary from opposite the alternately solitary leaves or sometimes several together at the end of the branchlets; calyx truncate; corolla funnel-shaped, tomentose, the tube about ¾ in. long, the lobes oblong, rather blunt.

HAB.—Not unfrequent in the mixed dry forests of the Prome district.—Fl. March.—l.—SS.=CaS.

4. **M. citrifolia,** L.; Bedd. Sylv. Madr., t. 220 (*M. bracteata,* Roxb.; Bedd. Sylv. Madr. 134-9).—*Nyaw-kyee.*—An evergreen tree (12—15+3—4+1—2) or a large shrub, all parts glabrous; stipules elliptically obovate to oblong, blunt; leaves oval to elliptically ovate, 6-9 in. long, tapering into a short petiole, acute to acuminate, entire, membranous, glabrous; flowers rather small, white, packed into an oblong or irregularly elliptical head on a ½-1 in. long glabrous peduncle arising solitary from opposite the alternately solitary leaves; calyx truncate or the calyces of the lower flowers in the head often produced into a leafy lanceolate or spatulate-lanceolate appendage; corolla funnel-shaped, glabrous, hairy at the throat, the lobes lanceolate, acute; filaments woolly; berries compound, the size of a pullet's egg or larger, unequally oblong to almost globular, pale greenish white, succulent, glossy.

Var. 1, **citrifolia proper**: stipules blunt; syncarps larger.

Var. 2, **bracteata** (*M. bracteata, Roxb.*): stipules usually acute; syncarps the size of a bullet or larger.

HAB.—Var. 2: not unfrequent in the forests of the Andamans; var. 1: generally cultivated in native gardens all over Burma.—Fl. Apr.-May.—s.

REMARKS.—Wood deep brownish yellow or bright yellow, close-grained, light, tough. Yields a bright yellow or very valuable red dye which is fixed with alum.

5. **M. angustifolia,** Roxb.—*Yai-yo.*—An evergreen tree (20—25+4—6+1—1½) or a large shrub, all parts glabrous; stipules from a broad base acuminate; bark ⅓ in. thick, rough, longitudinally fissured and peeling off in thin flakes; cut pale-coloured, dry; leaves more or less lanceolate, acuminate on both ends, on a slender ½-1 in. or somewhat longer petiole, 4-10 in. long, entire, membranous, glabrous; flowers rather small, white, sessile, packed into small globular heads resting on a ½-1 in. long glabrous peduncle arising from opposite the end-leaf of the branches or of the alternately solitary leaves; calyx truncate; corolla glabrous, the tube nearly ⅔ in. long, the lobes ovate to lanceolate, rather bluntish, the throat and the filaments glabrous; berries usually distinct, but only few of them coming to perfection, sessile on the oblong torus, the size of a large pea, obovate, succulent, deep black and shining, the pulp very dark coloured.

Hab.—Rather rare in the tropical forests of Martaban down to Tenasserim; frequently cultivated, especially by Karens in their betelnut-gardens.—Fl. March-Apr.—s.—SS.=Metam.

Remarks.—Wood yellow when fresh. Bark and wood used as a dye.

6. **M. persicæfolia,** Ham.—An evergreen, low, simple-stemmed branched shrub, 1-3 ft. high, all parts glabrous or rough from a minute indistinct pubescence; stipules from a broad base subulate-acuminate to acute; leaves lanceolate to elliptically lanceolate, acuminate at both ends and tapering into a 1-3 lin. long petiole, 2-4 in. long, entire, membranous, glabrous or scabrous from a minute indistinct pubescence; flowers rather small, pure white, sessile, in a small sessile or shortly peduncled head arising from opposite the alternately single leaves or from the base of the end-leaf; calyx truncate; corolla glabrous, funnel-shaped, the tube about ⅔ in. long, the lobes oblong, bluntish, with a glabrous throat; berries compound, smooth, irregularly oblong, the size of a cherry.

Var. 1, **persicæfolia proper:** all parts quite glabrous.

Var. 2, **scabra:** leaves, etc., more or less scabrous from a minute indistinct pubescence.

Hab.—Common in the savannah forests from Ava and Martaban down to Tenasserim; var. 2.: in Prome district.—Fl. March-May; Fr. June.—l.—SS.= All.

7. **M. Wallichii,** Kz.—A small evergreen tree (?), all parts quite glabrous; leaves oblong-lanceolate to oblong-linear, acuminate at both ends, on a ½-1½ in. long petiole, 3-5 in. long, entire, firmly membranous, glabrous, pale-coloured beneath; flowers rather small, white, by 3 or 4 in small heads forming a terminal glabrous stiff-peduncled small cyme; calyx truncate, the tube (in bud) only ¼ in. long, the lobes as long, oblong-linear, rather blunt.

Hab.—Tenasserim.

8. **M. umbellata,** L.; Bedd. Sylv. Madr. 134-9.—An evergreen scandent shrub, all parts glabrous; stipules sheath-like united, rupturing afterwards; leaves from elliptically oblong to lanceolate, tapering in a 2-3 lin. long petiole, rather abruptly and often bluntish acuminate, 2½-4 in. long, entire, chartaceous, glabrous, glossy and conspicuously net-veined on both sides; flowers small, greenish white, collected into small heads on 1-1½ in. long sparingly pubescent glabrescent peduncles collected by 5 or more in a sort of sessile umbel at the end of the branchlets; corolla almost rotate, with a very short tube, densely villous at the throat, the lobes about a line long or somewhat longer; berries connate and compound, irregularly globular, smooth, the size of a large pea.

Var. 1, **umbellata proper** (*M. umbellata,* L.): leaves pale-coloured and opaque beneath, the nerves not prominent.

Var. 2, **Jackii** (*M. tetrandra,* Jack): leaves glossy on both sides, the net-veination prominent.

Hab.—Var. 2: not unfrequent in the tropical forests of Martaban down to Tenasserim.

9. **M. speciosa,** Wall.—An evergreen scandent shrub of the habit of *M. rigida,* all parts quite glabrous; stipules sheath-like united or those of the stronger branches distinct and triangular; leaves from elliptical to elliptically obovate, acute at the base, on a rather slender petiole 3-5 lin. long, shortly and abruptly acuminate or apiculate, 3-4 in. long, entire, coriaceous, smooth, in drying turning brown; flowers collected in small peduncled heads, usually by threes, forming a brachiate poor corymb on a 1-1½ in. long peduncle arising from the end of the branchlets; calyx-tube elliptical, sulcate, the limb shortly 4-toothed.

Hab.—Tenasserim.

SARCOCEPHALUS, Afz.

Flowers without bractlets, sessile, on a more or less globular, usually fleshy receptacle. Calyx-tube more or less angular, the limb 4-6-cleft or -toothed, the lobes spatulate, almost clavate or terminated by a somewhat capitate appendix. Corolla more or less tubular-funnel-shaped, the limb 5- rarely 4-cleft, almost imbricate. Stamens as many as calyx-divisions; filaments very short or none. Ovary crowned by an epigynous disk, 2-celled, with several pendulous ovules in each cell, or spuriously 6-celled, the 4 spurious cells superposed and empty; style slender with a conical stigma. Capsules when fully ripe more or less fleshy and consolidated into a fleshy syncarp, or rarely free to, or near to, the base, 2-celled or with 4 spurious cells above the true 2 cells, at the base capsular-dehiscing.

Seeds numerous or often reduced to 1 or 2 in each cell, albuminous, only along one end winged.—Trees, with interpetiolar, very deciduous stipules. Flower-heads usually large, solitary, on longer or shorter peduncles arising from the end of the branches or from short axillary shoots.

* *Capsules connate, 2-celled at the base, and spuriously 4-celled above.*

All parts glabrous, young branchlets pruinous; leaves more or less acuminate . . . . . *S. cadamba.*

* * *Capsules not connate, 2-celled throughout their length.*

Young shoots glabrous or shortly pubescent; leaves more or less blunt . . . . . *S. cordatus.*

1. **S. cadamba** (*Anthocephalus cadamba*, Miq.; Bedd. Sylv. Madr., t. 33; Brand. For. Fl. 261.—*Ma-oo*).—A leaf-shedding tree (40—70+15—25+6—15), all parts quite glabrous, the young shoots more or less pruinose; stipules linear-lanceolate, blunt, glabrous and pruinose; leaves elliptically- to oblong-ovate, acute at the rounded base, on a slender 1-1½ lin. long petiole, 3-6 in. long, more or less acuminate, entire or waved, thin-coriaceous, glabrous and glossy; flowers small, yellow, sessile, closely packed into a fleshy globular head of 1-1½ in. in diameter, resting on a smooth 1-1½ in. long peduncle arising solitary from the end of the branchlets; bractlets none; calyx glabrous, the lobes oblong-spatulate; corolla glabrous, the tube about 2 lin. long, the lobes ⅓ as long; capsules fleshy, connate into a fleshy spherical syncarp, glabrous, the endocarp obovate-angular, 2-celled at the base, terminated by 4 hemispherically oblong, crustaceous, seedless spurious cells; seeds minute, wingless.

Hab.—In the moister upper mixed forests of the eastern slopes of the Pegu Yomah, descending into the lower mixed forests.—Fl. Feb.—SS.=SiS. All.

Remarks.—Wood deep yellow, loose-grained.—□′=73 pd.—Recommended for furniture.

2. **S. cordatus.** Miq.; Bedd. Sylv. Madr., t. 318.—*Ma-oo-let-tan-shay.*—A tree (40—60+25—30+5—6), shedding leaves in H.S., all parts glabrous or the young shoots softly and shortly pubescent; bark dark grey, about an inch thick, longitudinally fissured, smooth, transversely peeling off; stipules obovate-oblong, blunt, glabrous or puberulous; leaves broadly to elliptically ovate to almost rotundate, acute or acuminate at the more or less rounded base, on a ½-1 in. long glabrous or pubescent petiole, 3-6 in. long (in young trees 1-1½ in. long), shortly acute or blunt, entire, thin-coriaceous, glabrous and glossy, or shortly puberulous beneath; flowers small, yellow, sessile, more or less free, forming a globular head of an inch in diameter, on a glabrous ½-1 in. long somewhat nodding peduncle arising from the axils of the end-pair of leaves or at the end of short axillary shoots; bractlets none; calyx glabrous, the tube very

short, the lobes spatulate, about a line long; corolla glabrous, the tube about 2 lin. long, the lobes hardly half as long; capsules somewhat fleshy, densely packed into a syncarp, but hardly cohering, glabrous, about 2 lin. long, obovate, angular.

Var. 1, **glabra**: all parts, also the leaves, glabrous.

Var. 2, **pubescens**: leaves beneath petioles, stipules, and peduncles shortly and softly pubescent.

HAB.—Both varieties common in the mixed forests, especially the lower and savannah forests, all over Pegu and Martaban down to Tenasserim.—Fl. May. —l.—SS.=*All.* SiS.

REMARKS.—Wood pale-coloured, rather light, coarse, loose-grained.—□′=23 —34; break-weight=80—120 pd.—Soft, useless wood, decays in less than a year.

NAUCLEA, L.

Flowers in heads, with or without angular-clavate bractlets. Calyx-tube oblong, the limb short and truncate, or usually 5-parted, the lobes linear. Corolla funnel-shaped, the limb 4- or 5-cleft, valvate or nearly so. Stamens 4 or 5, inserted at the throat, the filaments short; anthers blunt or apiculate. Ovary 2-celled, the cells with numerous pendulous ovules attached to the semi-cylindrical placentas; style cylindrical with a clavate pyramidate or capitate stigma. Capsules free, surrounded by the calyx-lobes and bractlets, finally separating from the base into 2 valves and usually falling off altogether. Seeds minute, winged all round or on both ends.—Trees, with interpetiolar large stipules. Flowers small, in globular heads, solitary or arranged in terminal or axillary panicles.

* *Flowers without bractlets.*

× Flower-heads small, panicled.

All parts glabrous; leaves petioled . . . . . *N. polycephala.*

×× Flower heads large, solitary or by threes, terminal. All parts glabrous, at least the leaves.

Leaves on a ½-1 in. long petiole, acuminate; flower-heads often by threes . . . . . *N. excelsa.*

Leaves almost sessile, blunt; flower-heads solitary . . . *N. sessilifolia.*

* * *Flowers surrounded by angular-clavate bractlets.*

× Petioles very slender and thin; leaves thin-membranous, acute at the base.

Leaves cordate, petioled; flower-heads by 1-3, axillary . . . *N. cordifolia.*

Bractlets only half as long as the calyx; corolla-lobes about ¼ the length of the corolla-tube; flower-heads solitary, between 2 more persistent floral leaves . . . . . *N. parvifolia.*

Bractlets as long as the calyx; corolla-lobes about ¼ the length of the tube; floral leaves very deciduous, and the flower-heads soon forming dichotomous divaricate panicles . . . *N. diversifolia.*

×× Petioles very thick and pubescent; leaves large, cordate at the base.

Flower-heads dichotomously panicled; corolla-lobes as long as the short tube; leaves wrinkled above . . . . . *N. rotundifolia.*

* *Flowers without bractlets.*

1. **N. polycephala,** Wall.—An evergreen small tree, all parts quite glabrous; leaves oblong-lanceolate to broadly lanceolate, acute or acuminate at the base, on a glabrous petiole 4-10 lin. long, 3-5 in. long, shorter or longer acuminate, entire, thin-coriaceous, glossy, glabrous; flowers minute, sessile, on a hispid-tomentose receptacle, forming globular small heads of the size of a large pea on 4-8 lin. long peduncles arranged in a terminal glabrous panicle; bractlets none; calyx-tube short, pubescent, the lobes oblong-linear, blunt, about ½ a line long; corolla glabrous, the tube about a line long, the lobes as long; capsules obovate, a line long, usually crowned by the 5-lobed calyx-limb, slightly pubescent on the apex; seeds minute, linear, at both ends membranously acuminate.

Hab.—Tenasserim; Chittagong.

2. **N. excelsa,** Bl.—An evergreen large tree, all parts quite glabrous; stipules oblong-lanceolate, blunt; leaves oblong to ovate- and elliptically-oblong, rounded or acute at the base, on a glabrous petiole 3-10 lin. long, shortly and bluntish acuminate, 4-7 in. long, entire, thin-coriaceous, glabrous, in drying turning fuscescent; flowers small, sessile, on a densely villous-pubescent receptacle, forming a globular head of about an inch in diameter, on a 2-3 lin. long, very thick, glabrous peduncle terminating 1-2 in. long, thick, glabrous branchlets arising solitary or more (usually by threes) from the end of the branches; bractlets none; calyx very short, pubescent, the limb terminating in 5 clavate-angular, acute, pubescent, rather fragile segments of about 2 lin. length; corolla glabrous, about 4 lin. long; capsules obovate, about 2½ lin. long, separating from the base into 2 valves, leaving a persistent linear dissepiment; seeds linear, at both ends membranously acuminate.

Hab.—Pegu, at Myodwine.—Fl. Oct.

3. **N. sessilifolia,** Roxb.—*Hteing-kala.*—A leaf-shedding tree (40—90 + 25—50 + 3—8), all parts quite glabrous; bark about ⅓-½ in. thick, blackish, transversely fissured and cracked; cut dry, brown; leaves obovate-oblong to oblong and elliptically oblong, almost sessile, or on a very short (hardly a line long) thick petiole, rounded or sometimes almost cordate at the base, 6-8 in. long, quite blunt or rounded at the apex, entire, thin-coriaceous, of a glaucous green, smooth, glossy above; flowers small, forming globular heads of nearly an inch in diameter, on a globular, greyish tomentose-pubescent receptacle terminating the strong, at the middle scared, ½-1 in. long, glabrous, solitary and terminal peduncle; bractlets none; calyx-tube short, smooth, the limb grey-pubescent, terminating into 5 angular-clavate, truncate, pubescent segments more than 2 lin. long; corolla about 4 lin. long, tubular-funnel-

shaped, the tube glabrous or nearly so, the limb appressed grey-pubescent; capsules obovate, appressed greyish pubescent at the apex, about 2½ lin. long, crowned by the 5-toothed cupular calyx-limb; seeds linear, at both ends membranously acuminate.

Hab.—Common in the mixed forests, all over Pegu and Martaban; also Chittagong.—Fl. close of R.S.; Fr. Dec.-Jan.—l.—SS.=All. SiS.

Remarks.—Wood brown, rather coarse and close-grained.—□′=43—56; break-weight=208 pd.—Recommended for furniture.

* * *Flowers surrounded by angular-clavate bractlets.*

4. **N. cordifolia,** Roxb. (*Andina cordifolia,* Roxb.; Bedd. Sylv. Madr., t. 33, & Anal., t. 29, f. 2; Brand. For. Fl. 263, t. 33).—*Nhing-pen* or *Nhan-ben.*—A tree (40—80+10—40+4—10), shedding leaves in H.S., all softer parts densely and shortly pubescent or tomentose; stipules elliptical, blunt, pubescent or glabrous, deciduous; bark thick, dark grey, rough and longitudinally fissured; leaves more or less rotundate-cordate, on a tomentose more or less glabrescent petiole 1-2½ in. long, 3-5 in. long and broad, shortly acuminate, entire, firmly membranous, while young densely and shortly pubescent, turning more or less puberulous, especially beneath; flowers small, yellowish, sessile, forming a small globular head of about ½ an in. in diameter, resting on slender 1-3 in. long more or less puberulous or tomentose at the upper part very deciduously and minutely 2-bracted peduncles arising solitary or by 2-3, one behind the other, from the axils of the leaves or from above the scars of the fallen ones; bractlets somewhat longer than the calyx, clavate-angular; calyx puberulous, the lobes clavate and as long as the tube; corolla tubular, pubescent outside; capsules about 1½-2 lin. long, angular, truncate, free, pubescent, sessile on the villous-pubescent receptacle, dehiscing from the base into 2 valves, leaving the dissepiment often crowned with the summit of the calyx; seeds subulate, acuminate at one end, at the other terminating into 2 cusps.

Hab.—Common in all leaf-shedding forests, especially the mixed ones, all over Burma from Chittagong and Ava to Pegu and Martaban.—Fl. H.S.; Fr. begin. of C.S.—l.—SS.=CaS. Metam. Lat., etc.

Remarks.—Wood pale yellow or brown, rather close-grained, fibrous.—□′=42 pd.—Used for making combs, and likely valuable for furniture and house-carpentry.

5. **N. parvifolia,** Roxb. (*Stephegyne parvifolia,* Korth.; Bedd. Sylv. Madr., t. 34, & Anal., t. 29., f. 1; Brand. For. Fl. 262).—*Hteing-thay.*—A tree (25—50+8—12+3—6), shedding leaves in H.S., the younger parts puberulous; stipules elliptically obovate, blunt, glabrous, deciduous; leaves small and 1-2 in. long, or larger and from 3 to 6 in. long, elliptical to elliptically oboval, more or less

rounded at the base, on a slender pubescent petiole 2-10 lin. long, blunt or sometimes retuse, firmly membranous or sometimes thin-chartaceous, almost glabrous and glossy above, beneath minutely and thinly pubescent and parallel-nerved; flowers small, yellowish, sessile, in small dense heads of about $\frac{1}{3}$ in. in diameter, on a 1-2 lin. long pubescent or tomentose peduncle or almost sessile, supported by a pair of small deciduous floral leaves and forming a leafy, dichotomous, lax, spurious panicle at the end of the branches; bractlets angular-clavate, truncate, as long as the calyx; calyx pubescent, the truncate cup-shaped limb glabrous; corolla glabrous; capsules about a line long, glabrous, ovoid, sulcate, persistent on the small, globular, shortly hispid receptacle, crowned by the cup-shaped calyx; seeds ovate-acuminate, winged all round.

Var. 1, **parvifolia proper**: bractlets only half as long as the calyx; corolla-lobes about $\frac{1}{4}$ the length of the tube; flower-heads more constantly solitary between 2 floral leaves.

Var. 2, **diversifolia** (*N. diversifolia*, Wall.): bractlets as long as the calyx; corolla-lobes about $\frac{1}{4}$ the length of the tube; floral leaves very deciduous, the flower-heads soon in dichotomous divaricate panicles; leaves much larger (3-6 in. long), beneath more conspicuously pubescent; stipules pubescent.

Var. 3, **microphylla**: as former, but leaves small (only 1-2 in long), minutely and inconspicuously pubescent beneath; stipules glabrous.

Hab.—Common all over Burma from Ava and Martaban down to Tenasserim, in all mixed forests, especially the lower and savannah ones; var. 3: restricted to the savannah forests.—Fl. Sept.-Oct.; Fr. C.S.—l.—SS.=*All.* SiS.

Remarks.—Wood light chestnut-coloured, close-grained, heavy, the annual rings rather broad. □'=43; break-weight 170 pd.—Used for planking, but rots soon if exposed to wet; seems also fit for cabinet-making.

6. **N. rotundifolia**, Roxb.—*Bengka* or *bingah*.—A leaf-shedding tree (40—60+20—30+3—6), all softer parts shortly pubescent; bark about a line thick, roughish from short longitudinal corky-swelled fissures; stipules oblong, blunt, pubescent outside, deciduous; leaves large, broad-oval to elliptical and rotundate-oval, rounded to almost cordate at the base, on a thick pubescent petiole 4-6 lin. long, 6-12 in. long and nearly as broad, somewhat acute, but turning blunt, entire, rigidly chartaceous, glabrous and somewhat wrinkled above, beneath shortly but softly pubescent; flowers small, white, in small globular heads of about $\frac{1}{2}$-$\frac{3}{4}$ in. in diameter, like those of *N. parvifolia*, supported by a pair of very deciduous floral leaves, but sessile or on very short tomentose peduncles, forming a dichotomously branched spreading panicle at the end of the branches; bractlets angular-clavate, as long as the calyx, smooth; calyx-limb short,

truncate; corolla glabrous, the tube only a line long or somewhat longer, the lobes nearly as long; capsules obovate-oblong, sulcate, glabrous, about 1½ lin. long, crowned by the annular scar of the calyx-limb; seeds elongate-linear-lanceolate, acuminate at one end, winged all round.

Hab.—Common in the mixed forests, especially the upper and lower ones, all over Pegu and Martaban down to Tenasserim; also Chittagong.—Fl. close of R.S.; Fr. C.S.—SS.=All. *SiS.* Metam.

Remarks.—Wood pale yellow or brown, rather heavy, close-grained. □′= 45 pd.—Not much used; recommended for furniture.

CEPHALANTHUS, L.

Flowers in heads surrounded by linear clavate bractlets. Calyx obversely pyramidate, angular, 4-toothed, the teeth alternating with as many thick toothlets in their sinuses. Corolla tubular-funnel-shaped, 4-lobed, the lobes alternating with as many minute glands in their sinuses. Stamens 4, inserted at the throat, the filaments filiform. Ovary 2-4-celled, with a solitary pendulous ovule in each cell; style filiform with a capitate stigma. Fruit obversely pyramidate, coriaceous, containing 2-4 indehiscent 1-seeded cocci. Seeds pendulous, furnished with an apical, spongy, white arillus, very shortly winged at the apex. Albumen almost cartilaginous.—Shrubs or small trees, with longer, persistent, interpetiolar stipules. Flowers small in peduncled heads more or less panicled at the end of the branchlets.

1. **C. naucleoides,** DC.—An evergreen elegant small tree, 10 to 20 ft. high, or a large shrub, all parts more or less pubescent; leaves elliptically ovate to ovate, on a short-pubescent petiole 3-5 lin. long, rounded at the base, 3-4 in. long, shortly acuminate, entire, thick-membranous, minutely puberulous and glabrescent above, beneath more or less pubescent and parallel-nerved; flowers small, yellow, sessile, in globular heads of ½ an in. in diameter, on 1-2 in. long puberulous peduncles arranged in a terminal simple panicle or sometimes solitary in the axils of the uppermost leaves; calyx almost glabrous, pubescent along the margins of the blunt lobes and supported by subulate clavate-incrassate pubescent bractlets; corolla glabrous, the tube nearly 2½ lin. long, the lobes very short.

Hab.—Burma, probably Ava.

UNCARIA, Schreb.

Flowers usually pedicelled, rarely sessile, in heads, the receptacle glabrous or villous. Bractlets none. Calyx-limb shortly

tubular, 5-toothed or -cleft. Corolla tubular-funnel-shaped, the limb 5-parted, imbricate. Stamens 5, inserted at the throat, the filaments short; anther-cells terminated by an appendix. Ovary 2-celled, the cells with several ascending ovules attached to the middle of the placentas; style slender with a clavate stigma. Capsule 2-celled, crowned by the persistent calyx, septicidally opening by 2 longitudinal slits. Seeds usually numerous, minute, linear, winged, the wing at the upper end often 2-parted. Albumen fleshy.—Scandent shrubs, usually furnished with axillary hooked tendrils (sterile peduncles). Stipules interpetiolar, entire or 2-cleft. Flowers small, forming peduncled, axillary, solitary, globular heads.

* *Capsules long-stalked; leaves more or less pubescent beneath.*

Flowers large, on 1-2 lin. long velvety pedicels; calyx ½ an in. long; corolla hirsute . . . . . *U. ferruginea.*

Flowers almost sessile; calyx 2 lin. long; corolla velvety . . *U. sessilifolia.*

* * *Capsules sessile.*

× Calyx-limb long-toothed.

All parts more or less woolly-pubescent . . . . . *U. pilosa.*

× × Calyx almost truncate and obsoletely 5-toothed; leaves glabrous.

Leaves green on both sides . . . . . *U. lævigata.*

Leaves glaucous beneath . . . . . *U. sessilifructus.*

1. **U. ferruginea,** DC.—An evergreen, large, scandent shrub, all younger parts rusty-pubescent; stipules broad and large, cordate, afterwards 2-cleft to the base; leaves elliptical, rounded at the base, on a strong glabrescent petiole 4-6 lin. long, apiculate or shortly and abruptly acuminate, 4-6 in. long, entire, chartaceous or almost coriaceous, above glabrous, glossy and often somewhat wrinkled, the under-surface more or less rusty-pubescent and lacunose-netveined; flowers rather conspicuous, on 2-3 lin. long densely tawny or rusty-tomentose pedicels, forming a loose globular head of about 2½-3 in. diameter terminating the rusty-tomentose, more or less hooked, 1½-2½ in. long, solitary peduncles in the axils of the leaves, the peduncles of the lower leaves uncinnate and sterile; calyx-tube about a line long, rusty-tomentose, 5-angular, the limb greyish velvety, 3 lin. long, deeply 5-cleft; corolla tawny-hirsute outside, the tube 1 in. long or longer, the lobes about 2 lin. long; capsules spindle-shaped, tapering into the elongate pedicel, about ⅔ in. long, more or less rusty-tomentose, on the acuminate apex crowned with the persistent calyx-limb.

Hab.—Rather rare in the tropical forests of the eastern slopes of the Pegu Yomah; apparently common in Tenasserim.—Fr. C.S.—s : l.—SS.=SiS. Metam.

2. **U. sessilifolia,** Roxb.—A large scandent shrub, the youuger parts velvety-pubescent; leaves elliptical to elliptically ovate, more or less rounded at the base, on a 4-5 lin. long puberulous petiole, 3-5 in. long, shortly and abruptly bluntish acuminate, entire,

chartaceous, above glabrescent and more or less shortly pubescent along the nerves, beneath shortly pubescent all over and much net-veined; flowers rather small, white, sessile or nearly so, in a globular head of 1 to 1½ in. diameter terminating the compressed tawny-velvety solitary peduncles in the axils of the leaves, the lower peduncles usually reduced to uncinnate hooks; calyx grey-puberulous, the lobes linear, about a line long; corolla puberulous or velvety, the tube slender, about ½ in. long, sometimes much shorter, the lobes about a line long, blunt; capsules spindle-shaped, pubescent, when fully ripe about ½ an in. long and tapering into the elongate pedicel up to an inch long, crowned by the calyx-limb; seeds minute, terminating into 3 linear hyaline wings.

Hab.—In the tropical forests of the eastern slopes of the Pegu Yomah; also Tenasserim.—Fl. Sept.-Oct.; Fr. March.—s: l.—SS.=SiS. Metam.

3. **U. pilosa,** Roxb. — An evergreen, large, scandent shrub, all softer parts more or less pubescent or almost hirsute; leaves elliptically ovate to ovate, on a hirsute 1-2 lin. long petiole, 2-3 in. long, rounded at the base, long and rather abruptly acuminate, entire or nearly so, membranous, above shortly and often scabrously, beneath softly and often woolly, pubescent; flowers small, sessile, on a small pubescent receptacle, forming a lax globular head of about 1-1½ in. in diameter, on a hirsute or woolly, 1-1½ in. long peduncle arising solitary from the axils of the leaves; calyx pubescent, the tube about ½ a line long, the lobes spatulate-linear, as long as the tube; corolla slightly pilose, the tube about 3 lin. long, the lobes very short; capsules sessile, obovate-spindle-shaped, 3-4 lin. long, sparingly appressed-pubescent, crowned by the calyx-limb.

Hab.—Not uncommon in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Upper Tenasserim; also Ava hills.—Fl. begin. of R.S.; Fr. Nov.-Dec.—s: l.—SS.=SiS. Metam.

4. **U. lævigata,** Wall.—A large scandent shrub, all parts glabrous; leaves from elliptically ovate to elliptically lanceolate, acute at the base, on a 2-4 lin. long indistinctly puberous petiole, acuminate, 2-3½ in. long, thin-coriaceous, entire, glabrous; flowers small, sessile, on a small pubescent receptacle and forming a loose globular head of about an inch in diameter, on 2-3 in. long, glabrous, compressed, at the middle (or above it) bracted peduncles which arise solitary from the axils of the leaves or rarely racemosely along the end of the branchlets; calyx about a line long, pubescent, almost truncate; corolla glabrous, the tube 3-4 lin. long, the lobes very short.

Hab.—In the tropical forests of the eastern slopes of the Pegu Yomah; also Upper Tenasserim.—Fl. Feb.—s: l.

5. **U. sessilifructus,** Roxb.—A large scandent shrub, the younger parts somewhat pruinous, puberulous; leaves from elliptical to broadly obovate-lanceolate, on 3-4 lin. long, slender, obsoletely puberous petioles, 2-3 in. long, acute or obtuse at the base, shortly and abruptly acuminate or apiculate, thin-coriaceous, entire, glabrous, beneath more or less glaucous and with a tuft of hairs in the nerve-axils; flowers small, whitish, sessile, on a hispid-pubescent receptacle, forming a small globular head of about an inch or less in diameter on compressed, above the middle bracted, obsoletely puberous peduncles which arise solitary from the axils of the leaves or often racemosely along the end of the branchlets; calyx more than a line long, appressed-pubescent, truncate and obsoletely 5-toothed; corolla-tube slender, glabrous, 3-4 lin. long, the lobes very short, velvety; capsules sessile, spindle-shaped, crowned by the 5-toothed calyx-limb, about $\frac{1}{3}$ in. long, sparingly appressed-pubescent.

Hab.—In the tropical forests of Pegu and Tenasserim.—Fr. Nov.-Dec.—s : l.

LUCULIA, Sw.

Calyx-tube turbinate, the lobes of the limb unequal, deciduous. Corolla salver-shaped, with a long tube, the limb horizontally 5-lobed, imbricate in bud. Stamens 5, inserted in the corolla-tube; filaments very short. Disk annular. Ovary 2-celled, with numerous ovules in each cell attached to the 2-lamellate placentas; style slender; stigma 2-lobed. Capsule almost woody, 2-celled and septicidally 2-valved, many-seeded. Seeds minute, shortly winged at the apex, albuminous. Embryo minute, the cotyledons blunt.—Shrubs or small trees, with interpetiolar, subulate-pointed, deciduous stipules. Flowers showy, in terminal corymb-like panicles.

1. **L. gratissima,** Sw.—An evergreen shrub, glabrous or the young shoots somewhat puberous; leaves lanceolate to linear-lanceolate, acuminate at both ends, on a slender petiole up to $\frac{1}{2}$ in. long, membranous, 4-6 in. long, glabrous; flowers showy, rose-coloured, on longer or shorter pedicels, forming a terminal corymb-like panicle; calyx glabrous, the tube 2 lin. long, the lobes up to 4 lin. long, oblong or linear-oblong, stiff, erect, deciduous; corolla-tube about an in. long, lobes of the limb rotundate, 4-5 lin. long.

Hab.—Ava hills.—Fl. R.S.

HYMENODICTYON, Wall.

Calyx-tube ovoid, the limb 5-toothed; corolla funnel-shaped, naked at the throat, the limb 5-cleft. Stamens 5, inserted at the throat and included; filaments very short; anthers erect, oblong.

Ovary 2-celled, the cells with numerous ascending ovules imbricately attached to the linear placentas; style simple, long-exserted; stigma clavate-capitate or almost lobed. Capsule almost woody, 2-celled, opening loculicidally in 2 valves. Seeds numerous, compressed, surrounded by a membranous net-veined wing 2-cleft at the base. Albumen fleshy.—Trees, with glandular, serrate, deciduous, interpetiolar stipules. Flowers small, clustered, forming raceme-like thyrsoid panicles supported by more or less discoloured floral leaves.

1. **H. thyrsiflorum,** Wall.—*Khoosan.*—A tree (50—60 + 25—30 + 5—6), leafless during H.S., all softer parts velvety-pubescent; bark about 1½ in. thick, grey, cracking into small, thick, corky flakes; cut brown, rather dry; leaves elliptically to obovate-lanceolate, acuminate at the base, on a pubescent petiole 1-4 in. long, shortly and rather abruptly acuminate, 4-8 in. long, entire, membranous, shortly velvety-pubescent on both sides, turning somewhat roughish above; flowers small, greenish, on slender 1-2 lin. long pedicels, in small clusters, forming raceme-like shortly pubescent panicles supported by a whitish long-petioled floral leaf and arranged into a loose terminal usually drooping large panicle; calyx puberulous, about a line long; corolla 2 lin. long; capsules woody, oblong, ⅔ in. long, the valves furrowed along the middle and sparingly lenticellate; seeds ½ an in. long, surrounded by a brown erose-toothed wing 2-cleft at the base.

Hab.—Common in the mixed dry forests of the Prome district, rather rare in the upper mixed forests of the Pegu Yomah; also Chittagong.—Fl. Aug.; Fr. C.S.—l.—SS.=*CaS.* SiS.

Remarks.—Wood light, loose-grained. □′=28; break-weight=114 pd. Used for black-boards in Burmese schools, and for packing-cases.

HYMENOPOGON, Wall.

Calyx-tube obovate, the limb 5-parted, persistent. Corolla salver-shaped with a very long tube, the limb 5-parted. Stamens 5, included in the inflated summit of the tube. Ovary 2-celled, the cells with numerous imbricate ovules peltately attached to the placentas; style filiform, 2-lobed, the lobes linear. Capsule clavate-oblong, 10-nerved, crowned by the calyx-limb, 2-celled, opening at the apex in 2 valves, the valves 2-parted, many-seeded. Seeds oblong, at both ends terminating in a membranous linear acuminate wing.—Epiphytical shrubs, with crowded leaves and large membranous interpetiolar stipules. Flowers conspicuous, in terminal trichotomous corymbs furnished with large discoloured floral leaves.

1. **H. parasiticus,** Wall.—A leaf-shedding epiphytical branched shrub with ascending branchlets, the softer parts slightly and softly pubescent; leaves cuneate-obovate, 3-6 in. long, tapering at the base into a 1-2 lin. long puberulous or glabrous petiole, shortly acuminate, membranous, entire, on both sides on the nerves sprinkled with minute hairs; flowers conspicuous, white, on puberulous 6-10 lin. long pedicels, forming a terminal, puberulous, trichotomously branched corymb of which the uppermost branchings are furnished with a large, long-petioled, discoloured floral leaf; calyx puberulous, the lobes linear, about 4 lin. long; corolla 1-1¼ in. long; capsules ⅔ in. long, minutely puberulous.

Hab.—Epiphytic on the mossy trees of the upper dry forests on the summit of the Kambala ridges, Pegu Yomah, at about 3,000 ft. elevation.—Fr. C.S.—1.

WENDLANDIA, Bartl.

Calyx-tube almost globular, often striate, the limb minutely 4- or 5-toothed, persistent. Corolla-tube short, glabrous at the swollen throat, the limb 4- or 5-lobed, almost twisted in bud. Stamens 5, inserted at the summit of the tube and exserted; filaments short; anthers versatile. Ovary on a fleshy epigynous disk, 2-celled, the cells with numerous ovules on the hemispherical placentas; style exserted, filiform, with a 2-cleft stigma. Capsule globular, 2-celled, opening at the apex loculicidally in 2 valves. Seeds numerous, minute.—Trees or shrubs, with entire interpetiolar stipules. Flowers small, racemulose, spiked or clustered, and arranged in terminal thyrsoid panicles or in 1-sided spikes forming corymbose divaricate panicles.

* *Flowers 5-merous, sessile or shortly pedicelled, in irregular short spikelets, racemes or clusters, forming a thyrsoid terminal panicle.*

× Calyx-teeth short, triangular, acute.

All parts and leaves on both sides harshly and shortly pubescent . *W. scabra.*
Leaves more or less shortly pubescent beneath or glabrescent; panicle pubescent or tomentose . . . . . *W. tinctoria.*
All parts, also the panicle, quite glabrous; flowers minutely pedicelled . . . . . *W. glabrata.*

× × Calyx-teeth subulate-acuminate, as long or longer than the calyx-tube.

Leaves coriaceous, glabrous . . . . . *W. ligustrina.*
Leaves lanceolate, membranous, appressed-pubescent on the midrib beneath . . . . . *W. glomerulata.*

* * *Flowers 4- or 5-merous, in one-sided spikes, forming a divaricate corymbose panicle.*

All parts glabrous; flowers 5-or 4-merous . . . . . *W. secunda.*
All parts more or less tawny-pubescent; flowers 4-merous . . *W. corymbosa.*

1. **W. scabra,** Kz.—An evergreen tree (?), all parts shortly and roughish pubescent; stipules cordate-reniform, half-stem-clasping; leaves elliptically obovate or elliptical, acute or acuminate at the

base, on a $\frac{2}{3}$ in. long shortly pubescent petiole, shortly and bluntish acuminate, 3-4 in. long, entire, membranous, on both sides shortly and harshly pubescent; flowers minute, white, sessile, in small spikes, forming an ample, shortly pubescent, brachiate panicle at the end of the branchlets; calyx appressed-hispid, hardly $\frac{1}{2}$ a line long, the teeth small, 3-angular, acute; corolla glabrous, 1-1$\frac{1}{2}$ lin. long, the lobes short; capsules globular, $\frac{1}{2}$ a line in diameter, appressed minutely hispid.

Hab.—Ava, Khakyen hills.—Fr. May.

2. **W. tinctoria,** DC.; Bedd. Sylv. Madr. 130; Brand. For. Fl. 269.—An evergreen tree (20—30+8—12+2—2$\frac{1}{2}$), sometimes remaining shrubby, the young shoots more or less shortly pubescent; bark about $\frac{2}{3}$ in. thick, brown, fibrous, tortuously and longitudinally fissured; cut dryish, brown; stipules triangular, acuminate; leaves broadly lanceolate to obovate-lanceolate, on a more or less puberulous petiole $\frac{1}{4}$ to $\frac{1}{2}$ inch long, 3-4 in. long, acute or acuminate at the base, entire, bluntish or blunt-acuminate, almost coriaceous or thick-membranous, glabrous above, beneath more or less shortly puberulous and often quite glabrescent; flowers small, white or yellowish white, sessile, in little spikes forming an ample more or less pubescent or tomentose panicle at the end of the branchlets; calyx about $\frac{1}{2}$ a line long, greyish pubescent, the teeth minute; corolla glabrous, 2 lin. long, the lobes short, rounded; anthers almost sessile between the lobes; capsules globular, hardly a line in diameter, sparingly and shortly pubescent.

Hab.—Frequent in the open and dry forests from Ava and Martaban down to Tenasserim, ascending also into the hill Eng and drier hill forests, up to 4,000 ft. elevation.—Fl. Febr. March; Fr. March, Apr.—l.—SS.=Dil. CaS. Metam.

Remarks.—Wood dark brown, fine-grained.

3. **W. glabrata,** DC.—An evergreen tree (20—25+10—12+$\frac{3}{4}$—1$\frac{1}{4}$), all parts quite glabrous; stipules broad, long and abruptly acuminate; leaves lanceolate to broadly lanceolate, acuminate at both ends, on a $\frac{1}{2}$-$\frac{1}{4}$ in. long or shorter glabrous petiole, 3 in. long, entire, coriaceous, glabrous; flowers minute, white, on very short but distinct pedicels, forming 1-sided small racemes arranged in a more or less ample, quite glabrous, thyrsoid panicle at the end of the branchlets; calyx about $\frac{1}{4}$ lin. long, glabrous, the teeth minute; corolla glabrous, about 1-1$\frac{1}{2}$ lin. long, the lobes short, blunt; anthers almost sessile between the lobes; capsules globular, glabrous, about $\frac{1}{2}$ a line in diameter.

Hab.—Frequent in the drier hill forests of Martaban and Tenasserim, at 2,000 to 4,000 ft. elevation.—Fl. March.—s.—SS.=Metam.

4. **W. ligustrina,** Wall.—An evergreen small tree, all parts glabrous; stipules rounded, minutely mucronate; leaves obovate-

lanceolate to elliptically lanceolate, acuminate at both ends, on a $\frac{1}{2}$-$\frac{2}{3}$ in. long glabrous petiole, 2-4 in. long, entire, coriaceous, glabrous; flowers small, sessile and clustered, forming a slightly appressed-pubescent bracted panicle at the end of the branchlets; calyx a line long, appressed-pubescent, the teeth acuminate, almost as long as the tube; corolla glabrous, the tube only a line long or longer, the lobes almost as long; anthers exserted.

HAB.—Ava, Taongdong hills; Tenasserim.—Fl. Nov.

5. **W. glomerulata,** Kz.—An evergreen small tree or shrub, the younger parts indistinctly puberulous; stipules leafy, cordate; leaves linear-lanceolate to lanceolate, acute or acuminate at the base, tapering into a very short (1-3 lin. long) puberulous petiole, 3-4 in. long, long-acuminate, entire, membranous, glabrous, beneath on the midrib minutely appressed-pubescent; flowers sessile, in short-peduncled clusters arranged in a terminal slightly pubescent brachiate panicle; calyx (in fruit) appressed pubescent, the teeth linear-lanceolate and apparently longer than the tube; capsules globular, hardly a line in diameter, pubescent.

HAB.—Tenasserim.

6. **W. secunda,** Griff.—An evergreen shrub, all parts glabrous; stipules triangular, acuminate; leaves narrowly obovate-lanceolate, tapering at the base into a $\frac{1}{4}$-1 in. long glabrous petiole, 4-5 in. long, bluntish acuminate, entire, thick-membranous, glabrous; flowers small, yellowish, sessile, in dichotomously forked one-sided spikes, forming an ample, minutely puberulous, brachiate, divaricate corymb at the end of the branchlets; calyx about $\frac{1}{2}$ lin. long, minutely puberous or indistinctly mealy, 4- or 5-toothed, the teeth minute; corolla-tube elongate, the limb 5-4-lobed; stamens 4 or 5, included; capsules globular, crowned by the calyx-limb, slightly 2-lobed, a line in diameter, glabrous or nearly so.

HAB.—Southern Tenasserim.—Fl. Aug.

7. **W. corymbosa,** DC.—An evergreen shrub, all parts, at least while young, more or less pubescent; stipules broadly lanceolate, pubescent; leaves broader or narrower, obovate-lanceolate, decurrent on a shorter or longer pubescent petiole, shortly and rather abruptly acuminate, 4-10 in. long, entire, membranous, above roughish from short hairs, beneath, especially along the nerves, more or less pubescent; flowers white, sessile, in one-sided spikelets arranged into a brachiate, divaricate, more or less tawny-pubescent corymbose panicle at the end of the branchlets; calyx pubescent, 4-toothed, the teeth lanceolate, as long as the tube; corolla funnel-shaped, about 3 lin. long; capsules obscurely 2-lobed, globular, about a line in diameter, minutely pubescent.

HAB.—Tenasserim.

PAEDERIA, L.

Calyx-tube ellipsoid, the limb short, 5- or rarely 4-toothed, -lobed or almost truncate, persistent. Corolla funnel-shaped, the limb 5- or 6- rarely 4-lobed, valvate-plaited in the bud. Anthers almost sessile, included in the tube. Ovary 2-celled, with a solitary pendulous ovule in each cell; style with 2 short stigmatic lobes. Fruit a dry berry or capsule, with a very thin fragile pericarp dehiscing irregularly with a tendency to septicidal, containing 2 more or less winged chartaceous cocci incompletely covering the flat winged or wingless seed and suspended from a thread-like spermaphore. Albumen fleshy.—Twining perennials or shrubs, often of a fœtid smell, with simple interpetiolar stipules. Leaves opposite or whorled. Flowers small, in loose dichotomous or trichotomous often one-sided cymes in the axils of the leaves or collected into terminal panicles.

* *Ripe seeds not winged; capsules globular.*

Glabrous or pubescent; corolla scurfy-tomentose or velvety outside. *P. tomentosa.*

* * *Ripe seeds broadly winged; capsules more or less compressed.*

\+ Corolla mealy- or scurfy-tomentose or velvety outside.

Quite glabrous; calyx-lobes shorter than the calyx-tube; seed-wings pale-coloured . . . . . *P. fœtida.*

Sparingly and shortly puberulous; calyx-lobes longer than the tube; seed-wings blackish . . . . . *P. calycina.*

\+ \+ Corolla sparingly and shortly pilose.

All softer parts, and especially the under-surface of the leaves, villous-tomentose; seed-wings corky, pale-coloured . . *P. lanuginosa.*

1. **P. lanuginosa,** Wall.—A large twining shrub, with the main stem as thick as a man's arm, all softer parts more or less scurfy-tomentose or pubescent; leaves cordate-ovate to ovate-lanceolate, on a tomentose 1-4 in. long petiole, 4-6 in. long, acuminate to acute, entire, thick-membranous, above scabrous from minute bristles, beneath densely and often whitish or yellowish scurfy-villous; flowers rather small but conspicuous, dull purple, crimson within, sessile or nearly so, forming small, rather compact, villous or pubescent trichotomous cymes arranged in a brachiate thyrsoid panicle in the axils of the leaves and terminal; calyx tawny or yellowish villous, nearly a line long, the teeth short and recurved; corolla ½-⅔ in. long, funnel-shaped, especially inside sparingly and shortly pilose, the lobes short, trilobulate; capsules ovoid-oblong, nearly ½ an in. long, compressed, brown and glossy, crowned by the small calyx-lobes; seeds conform to the capsule, flat, surrounded by a corky pale-coloured wing about a line broad.

Hab.—Frequent in the mixed forests, especially along choungs, all over Burma from Ava and Martaban down to Tenasserim; also frequently entering deserted toungyas.—Fl. Jan.-July; Fz. Jan.-March.—l.—SS. = All. SiS. Metam., etc.

COMPOSITÆ.

Flowers (usually called florets) collected into a head (very rarely reduced to a single or a few florets), surrounded by an involucre of several to many bracts either in a single or several rows, the whole appearing like a single flower. Receptacle on which the florets rest either naked or with chaffy scales or hairs or bristles between the florets. Calyx-limb wanting or transformed into a pappus or ring of hairs or scales on the top of the calyx-tube. Corollas either all hermaphrodite, tubular and 5- or rarely 4-toothed (heads *discoid*), or all hermaphrodite and ligulate (*i. e.*, tubular with a flat strap-shaped lamina), or those of the centre or disk tubular and hermaphrodite or male, and those of the circumference either ligulate and female or neuter, forming a ray (heads *radiate*), or filiform and female (heads *discoid*, but *heterogamous*). Stamens 5, rarely 4, inserted in the tube of the corolla, the anthers linear and united in a tube round the style (except in *Xanthium*), 2-celled, opening inwards by longitudinal slits, the basal lobes sometimes prolonged into short or long, fine, hair-like points called *tails*, the connective usually produced at the top into a small erect appendage. Ovary inferior, with a solitary erect ovule; style filiform, usually with 2 short stigmatic lobes. Fruit a dry nut or achene, crowned by the pappus or naked. Seed erect, without albumen. Embryo straight, or rarely curved. Radicle inferior.—Herbs or shrubs, very rarely trees, sometimes scandent, with alternate or opposite leaves. Stipules none. Flower-heads terminal or rarely axillary, solitary, or in panicles or corymbs, sometimes reduced to clusters or heads.

The largest family of phanerogams, numbering nearly 10,000 species. About 120 species have been found in Burma, of which only very few are woody. A bitter matter, combined with astringency, an acrid resinous substance, and some ethereal oil, are the usual characteristics of the tubulifloral species, some of which are tonics, others stimulants, and others astringents. The ligulifloral species abound in milky, bitter, astringent, or narcotic juice. To the former category reckon wormwood (*Artemisia*), used also for febrifuges and absinthe-liqueur. Milfoils (*Achillea millefolium*) is highly astringent. Chamomile (*Anthemis nobilis*) is a well-known stimulating tonic. Oil abounds in the seeds of many species, and some of them, like sunflower (*Helianthus annuus*), *Madia sativa*, and *Guizotia oleifera*, are locally cultivated on a larger scale. Safflower (*Carthamus*) furnishes a beautiful pink dye, and is much cultivated in Prome district. Chicory (*Cichorium intybus*) is much cultivated in Europe for its tap-root, used as a substitute for coffee.

Only a few are noteworthy as esculents, like garden-lettuce (*Lactuca sativa*), artichokes (*Cynara scolymus*), endive (*Cichorium endivia*), and a few others.

* Flower-heads homogamous, discoid, the florets all tubular, hermaphrodite, and regular or nearly so. Anthers usually fringed or tailed at base; style usually slightly thickened at the base of the narrow and blunt or slightly pointed often erect branches.

Pappus long, capillary; involucre scarious, simple . . . . *Leucomeris.*

* * Flower-heads homogamous, discoid, the florets all tubular, hermaphrodite, and regular or nearly so. Anthers usually obtuse at base, without tails; style-branches subulate and acute, not swollen at the base.

Involucre ovoid, without leafy bracts; pappus of capillary bristles with a few, or a ring of short ones, outside . . . . *Vernonia.*

* * * Flower-heads either heterogamous or dioecious, the female florets ligulate or filiform, the hermaphrodite or males tubular. Anthers various; style-branches in the hermaphrodite florets usually more or less flattened, produced beyond the stigmatic lines into tips or appendages, papillose on the outside.

Female florets filiform; pappus of simple capillary bristles; anthers without tails . . . . . *Conyza.*

As former, but anthers with fine tails; involucral bracts herbaceous or soft; style of the disk-florets branched . . . *Blumea.*

Anthers with fine tails; involucral-bracts rigid; style of disk-florets simple . . . . . *Pluchea.*

LEUCOMERIS, Don.

Flower-heads homogamous, discoid, all florets hermaphrodite and fertile. Involucre ovoid, the bracts in many rows, ovate to elongate-lanceolate, coriaceous and dry, the outer ones gradually shorter. Receptacle flat, naked. Corolla regular, tubular, the limb slightly widened, narrowly 5-parted, the segments more or less revolute. Anthers sagittate at the base, the auricles terminating into ciliate tails. Style filiform, slightly thickened towards the apex, slightly 2-lobed. Achenes oblong, almost terete, 5-ribbed, silky-pubescent, the pappus consisting of numerous roughish bristles.—Shrubs or small trees, with ample, alternate, entire leaves. Flower-heads usually few-flowered, in terminal corymbs or clusters.

1. **L. decora**, Kz.—A tree (12—15+3—4+1), leafless in H.S., the young shoots white villous-tomentose; leaves elliptically- to oblong-lanceolate, acute at the unequal base, on a glabrous petiole ½-1 in. long, 5-7 in. long, acuminate, membranous, when full-grown glabrous or nearly so; flower-heads on 3-4 lin. long imbricate-scaly peduncles, densely crowded at the end of the leafless branchlets; involucre elongate-cyathiform, narrowed into the scaly peduncle, the bracts lanceolate, rigid, thinly arachnoid-woolly, green, the outer ones

gradually shorter; florets white, fragrant, nearly an inch long; pappus pale tawny, ½ an in. long; achenes ½ an in. long, sulcate, densely appressed villous-silk-hairy.

Hab.—Not unfrequent in the Eng forests of the Prome district.—Fl. March.—l.—SS.=*Lat.* CaS.

Remarks.—Wood soft, white.

VERNONIA, Schreb.

Flower-heads homogamous, the florets all tubular. Involucre from almost globular to cylindrically oblong and turbinate, the bracts in many rows, imbricate, dry or almost herbaceous, the outer ones gradually shorter or very rarely expanded into leaves. Receptacle almost flat, naked, foveolate or minutely hairy. Corolla regular, the limb narrowly 5-cleft. Anthers sagittate at the base, the auricles blunt or acuminate, but not tailed. Style-branches subulate, shortly hairy. Achenes 8-10-ribbed, or rarely almost 4-5-cornered, truncate at the apex. Pappus usually in 2 rows, the inner bristles elongate, thin or chaffy-complanate, rough-hairy or rarely smooth, the outer ones much shorter and fewer or altogether wanting.—Shrubs or herbs, rarely trees, with alternate simple leaves. Flower-heads terminal, solitary, or usually in cymose panicles.

* *Pappus dirty straw-coloured or whitish.*
× Trees or erect shrubs.
○ Leaves glabrous and glossy above, entire, the petiole slender, 1-1½ in. long . . . . . *V. arborea.*
○ ○ Leaves more or less puberulous, pubescent or villous on both sides; the petiole strong and thickly pubescent.
Leaves shortly pubescent, acute to acuminate, decurrent at the long-narrowed base; involucre-bracts 2 lin. long, slightly keeled . . . . . *V. acuminata.*
Leaves broadly ovate, acute, villous; involucre-bracts 1½ lin. long, few, plain, densely appressed silk-hairy . . . . . *V. Kurzii.*
× × Scandent shrubs; leaves linear to linear-oblong, silvery-silk-hairy beneath . . . . . *V. eleagnifolia.*
* * *Pappus more or less tawny to red-brown coloured. Scandent shrubs.*
Almost glabrous; flower-heads 5- (usually 10-) to 25-flowered; achenes appressed-pilose . . . . . *V. blanda.*
Leaves pubescent on the nerves beneath; achenes quite glabrous . *V. scandens.*

1. **V. acuminata,** DC. (*V. volkameriæfolia*, DC.; Bedd. Fl. Sylv. Madr., t. 225).—An evergreen treelet (15—25 + 3—4 + 1), all parts shortly pubescent; bark 2-3 lin. thick, brittle, longitudinally and transversely cracked, ash-grey; cut brown, dryish; leaves obovate to oblong-obovate, bluntish or tapering at the narrowed base and decurrent on the strong pubescent petiole of about ½-⅓ in. length, acute to shortly acuminate, ½-1¼ ft. long, rigidly papery, above

glabrescent, beneath shortly pubescent all over; flower-heads sessile or shortly peduncled, cymose, middling-sized, forming a greyish or tawny-pubescent ample panicle at the end of the branchlets; involucre-bracts gradually larger upwards, up to 2 lines long, concave-oblong, rigidly coriaceous, acute, slightly keeled, appressed-pubescent outside; florets lilac, 3 to 10; achenes ribbed, glabrous or nearly so, the pappus white or whitish.

Hab.—Not unfrequent in the drier hill and the Eng forests of the Martaban hills; Ava, Kakhyen hills, at elevations from 2,000 to 4,000 ft.—Fl. Feb.-March; Fr. Apr.—l.—SS.=Lat. Metam.

Remarks.—Wood whitish, turning pale brown, coarse, heavy, close-grained, rather hard, the heartwood narrow, dark-greyish brown, of a soft and almost corky consistence.

2. **V. arborea,** Ham.; Bedd. Fl. Sylv. Madr. 135.—An evergreen tree 50-60 ft. high, the shoots tawny-pubescent; leaves oblong to ovate-oblong, acute or rounded at the base, on a slender slightly puberulous and glabrescent petiole about 1 to 1½ in. long, caudate-acuminate, 3 to 6 in. long, coriaceous, entire, more or less puberulous or pubescent beneath, above glabrous and glossy; flower-heads small, 3-5-flowered, sessile or nearly so, cymose, and forming larger or smaller tawny-tomentose panicles at the end of the branchlets; involucre-bracts gradually larger below, up to 1¼ lin. long, ovate, bluntish, plain, brown and minutely puberulous outside; florets lilac; achenes about 5-angular, minutely puberulous or almost glabrous, the pappus whitish.

Hab.—Tenasserim.

3. **V. Kurzii,** Clark.—An evergreen treelet (15—18 + 8—10 + ⅓—¼), or usually a large weak shrub, all softer parts densely pubescent or villous; leaves broadly ovate, rounded or slightly cordate at the base, on a thick tawny-villous petiole ½ to nearly an inch long, shortly acuminate to acute, 3-4 in. long, remotely repand-toothed to entire, membranous but thickly villous, especially beneath; flower-heads rather small, sessile and slenderly but shortly peduncled, cymose, forming larger or smaller tomentose panicles in the axils of the uppermost leaves and at the end of the branchlets; involucre-bracts rather few, the inner ones about 1½ lin. long, bluntish or almost acute, ovate, plain, and densely appressed silk-hairy outside; florets few (?); achenes ribbed, glabrous, the pappus scanty, white.

Hab.—Not unfrequent in the drier hill forests of the Martaban hills east of Tounghoo, at 1,000 to 2,500 ft. elevation, freely springing up in the hill toungyas.—Fl. March.; Fr. Apr.—l.—SS.=Metam.

4. **V. eleagnifolia,** DC.—An evergreen, large, scandent shrub, the shoots silvery silk-hairy; leaves linear to linear-oblong, acute at

the base, on a densely silky, short, slender petiole, bluntish, with a mucro, 1½ to 2 in. long, chartaceous, entire, glabrous above, densely appressed silk-hairy beneath; flower-heads small, few-flowered, almost sessile and clustered, cymose, forming divaricate smaller or larger panicles in the axils of the upper leaves and collected into large terminal ones; involucre-bracts in several rows, gradually larger from below, ovate-oblong, bluntish to acute, scarious, nearly 2 lin. long, almost glabrous; achenes glabrous, angular, the pappus whitish.

Hab.—Tenasserim, apparently frequent about Moulmein, Mergui.—Fl. Jan.-to March; Fr. March to May.

5. **V. blanda,** DC.—An evergreen scandent or rarely almost erect shrub, the shoots sparingly and minutely pubescent; leaves elliptically lanceolate to ovate, acute at the base, on a slender petiole 3-4 lin. long, finely acuminate, 3-4 and occasionally up to 5½ in. long, membranous, entire, glabrous or indistinctly puberulous on the nerves beneath; flower-heads rather large, shortly peduncled, forming shortly pubescent poor cymes at the end of axillary shoots and collected into panicles at the end of the branchlets; involucre-bracts numerous, in several rows, gradually larger from below, linear, nearly 4 lin. long, acute, ciliolate on the margins; florets blue; achenes pilose, ribbed, the pappus tawny.

Hab.—Rather frequent in grass jungles and hill toungyas of Pegu and Martaban; Upper Tenasserim.—Fl. Fr. Jan.-Feb.—l.—SS.=Alum. Metam.

6. **V. scandens,** DC. — An evergreen scandent shrub, the younger branchlets shortly pubescent; leaves elliptically to broadly and ovate-lanceolate, acute at the base, on a more or less puberulous petiole 4 to 5 lin. long, acuminate, 4 to 5 in. long, entire, membranous, puberulous on the principal nerves beneath; flower-heads somewhat smaller than those of the preceding species, shortly peduncled, forming small panicles at the end of the axillary shortly pubescent shoots and usually collected into larger terminal ones; involucre-bracts in several rows, gradually longer upwards, lanceolate-oblong, about 3 lin. long, rather acute or bluntish, ciliate on the margins; florets blue; receptacle hispid to almost glabrous; achenes quite glabrous, the pappus tawny-coloured.

Hab.—Pegu; Ava.

MICROGLOSSA, DC.

Flower-heads heterogamous, the florets all fertile, the outer ones in 1 or more rows and forming a minute ray. Involucre bell-shaped, the bracts imbricate in many rows, almost scarious, the outer ones smaller. Receptacle flat, nude or minutely piliferous.

Female corollas narrowly ligulate, the hermaphrodite ones regular, tubular, the limb 2-cleft. Anthers obtuse at the base. Style-branches of hermaphrodites complanate. Achenes angular, the pappus setose, thin, in 1 or 2 rows, slightly unequal.—Scandent shrubs, with entire leaves. Flower-heads small, corymbose, or corymbosely paniculate; florets blue or lilac.

1. **M. volubilis,** DC.—An evergreen, large, scandent shrub, the branchlets more or less pubescent; leaves ovate to ovate-lanceolate, acute at the base, acuminate, 1½ to 2 in. long or longer, membranous, entire, on both sides (above roughishly) puberulous; flower-heads small, sessile or shortly peduncled, cymose and forming more or less divaricate puberulous or almost glabrous corymbs at the end of the branchlets; involucre-bracts linear, bluntish, thin-scarious, 1-nerved, ciliate; florets all lilac; achenes angular, minute, glabrous, the pappus silky, about 2 lin. long, pinkish pale-coloured.

Hab.—Frequent in hill-poonzohs all over Martaban and Tenasserim, up to 3,500 ft. elevation; Ava, Kakhyen-hills.—Fl. Feb.; Fr. March.—l.—SS.= Metam.

BLUMEA, DC.

Flower-heads heterogamous, discoid, the outer fertile florets female and in several rows, those of the disk often few and rarely sterile. Involucre ovoid to bell-shaped, the bracts imbricate in many rows, narrow, herbaceous to chartaceous, the outer ones gradually smaller. Receptacle flat, nude or pilose. Female corollas filiform, minutely 2-3-toothed, the hermaphrodite ones regular, tubular, the limb somewhat inflated and 5-toothed. Anthers sagittate at the base, the basal lobes more or less thinly caudate-acuminate. Style-branches of hermaphrodites narrowly complanate or almost filiform. Achenes almost terete or angular-ribbed, the pappus thin, in a single row, often deciduous.—Herbs or under-shrubs, rarely shrubs, with lobed or toothed, rarely entire leaves. Flower-heads small or middling-sized, clustered and in spikes or more usually variously panicled; florets often yellow.

1. **B. balsamifera,** DC.—*Poung-ma-theing.*—An evergreen shrub sometimes growing out into a small tree (15+1—3+⅓—⅕), all softer parts densely appressed-villous; leaves lanceolate to oblong-lanceolate, pinnately 6-2-foliolate on the densely pubescent petiole of ⅓ to ⅔ in. length, acuminate at both ends, the lower ones 3 to 5 in. long, repand-toothed, membranous, but thickly silky-villous; flower-heads rather small, shortly peduncled, forming smaller or larger panicles in the axils of the upper-leaves and gradually transformed into terminal large tomentose panicles;

involucre-bracts silky-pilose, linear-subulate, acuminate, about 3 lin. long, the outer ones gradually shorter; florets numerous, yellow; achenes minute, glabrous, the pappus soft, 3-3½ lin. long, pinkish pale-coloured.

HAB.—A most common and troublesome weed freely springing up in deserted toungyas and savannahs, along river-sides, etc., all over Burma, up to 3,000 ft. elevation.—Fl. Fr. H.S.—l.—SS.=∞.

REMARKS.—Wood pale-coloured, rather light, but close-grained, soft. Yields camphor equal to the Chinese one.

PLUCHEA, Cass.

Flower-heads heterogamous, discoid, the outer fertile, those of the disk usually few, hermaphrodite. Involucre from ovoid to almost hemispherical, the bracts imbricated in few or many rows, ovate to narrow, rigid or usually dry-membranous. Receptacle flat, nude. Female corollas filiform, 3-cleft or minutely toothed at the apex, the hermaphrodite ones regular, tubular, the limb slightly widened and 5-cleft. Anthers sagittate at the base, the basal lobes acuminate-caudate. Style-branches of hermaphrodites filiform. Achenes small, 4-5-angled, the pappus rigidly setose, in a single series.—Shrubs, with usually toothed or pinnatifid leaves. Flower-heads often small, in terminal corymbs; florets usually lilac.

1. **P. Indica,** Less.—*Kayoo.*—An evergreen large shrub, all parts glabrous or the young shoots puberulous; leaves obovate to cuneate-obovate, shortly petioled to almost sessile, bluntish to acute, 1-2 in. long, membranous, sinuate-toothed, glabrous; flower-heads small, sessile or nearly so, forming usually glabrous terminal corymbs; bracts rigid, the outer ones ovate and bluntish, the innermost ones linear, acute, about 2 lin. long; florets lilac; achenes minute, the pappus white.

HAB.—Frequent in the beach and tidal forests, and entering the tidal savannahs, all along the coasts from Chittagong down to Tenasserim and the Andamans.—Fl. C.S.; Fr. H.S.—l.—SS.=Sal. Aren. ca.

CAMPANULACEÆ.

Flowers hermaphrodite, rarely unisexual. Calyx-tube usually adnate to the ovary, the limb 5- or 3-10-lobed, persistent. Corolla regular or irregular, with as many lobes as calyx-divisions, valvate, the margins often induplicate. Stamens as many as corolla-lobes and alternating with them, inserted at the base of the corolla, but free from, or very rarely more or less adnate to, it; anthers opening longitudinally, free or united in a ring round the style. Ovary inferior or rarely superior or free except the broad base, 2- or more-

celled, with numerous ovules in each cell; style simple or divided at the top into as many stigmatic lobes or branches as there are cells to the ovary. Fruit usually a capsule, opening either in short valves at the top or in lateral pores or slits, rarely an indehiscent berry. Seeds numerous, small. Embryo straight, often very small, in a fleshy albumen.—Herbs or rarely shrubs or little trees, usually with milky juice. Leaves alternate or very rarely opposite, simple or rarely pinnatifid. Stipules none. Flowers solitary or clustered and axillary, or in terminal spikes, racemes, or panicles.

Of this order 14 species inhabit Burma, but only one of this may pass as a shrub or little tree. All the true Lobeliads are of a suspicious character, and *Isotoma longiflora*, a West Indian plant, now fully nuturalized in Java and Singapore, is a most poisonous plant.

SCÆVOLA, L.

Calyx-limb usually very short, 5-parted. Corolla oblique, the tube slit on the upper side down to the base, the lobes nearly equal, or the upper ones shorter, usually at length digitately expanding. Stamens free. Ovary wholly inferior or rarely free at the summit, 2-celled, with a solitary erect ovule in each cell, or 1-celled with 1 or 2 erect ovules; style simple, cupular-dilated at the apex, enclosing the truncate or divaricately 2-lobed stigma. Fruit indehiscent, more or less succulent or membranous, the endocarp woody or bony, rarely thin and crustaceous. Seeds albuminous.—Herbs or shrubs, rarely small trees, with alternating simple leaves. Flowers solitary between two bractlets, sessile or peduncled, axillary, the peduncles often dichotomously branched with a flower in each fork.

1. **S. Kœnigii**, Vhl.—*Penglai-htan.*—An evergreen large shrub, sometimes growing out into a small tree of 10 to 15 ft. high, the stem rather thick and succulent, all parts glabrous; leaves obovate-oblong to obovate, tapering and decurrent into the very short petiole or almost sessile, very blunt, 4-6 in. long, entire, fleshy-membranous, glabrous; flowers white, soon turning brownish, on silk-hairy pedicels, forming a short silky-pubescent or almost glabrous shortly-peduncled dichotomous cyme in the axils of the leaves; bracts small; calyx-lobes linear-oblong, very variable in length, but usually as long or longer than the corolla-tube; corolla about ¾ in. long, more or less pubescent, especially within, the lobes obovate-oblong, blunt, waved and fringed; drupe the size of a pea, ovoid or almost globular, sappy, white, puberulous.

Hab.—Frequent in the beach and tidal forests along the shores of Tenasserim and the Andamans.—Fl. Fr. ∞.—l.—SS.=Aren. Sal.

Remarks.—Wood fibrous, coarse, milky, useless, the pith soft and spongy.

ERICACEÆ.

Calyx more or less deeply 5- or 4-lobed or -toothed, the tube adnate to the ovary or quite free, sometimes very short. Corolla inferior or superior, the tube ovoid and globular to elongate, the lobes valvate or imbricate, very rarely the petals distinct. Stamens usually twice as many, rarely as many, as corolla-lobes, inserted within the corolla, but free from it; anthers 2-celled, opening at the summit by 2 separate pores or oblong slits, or rarely by 2 longitudinal slits. Hypogynous disk very small or none. Ovary usually with as many cells as corolla-lobes, rarely more or fewer (3 or 2), the cells with 1 or several ovules attached to the axial placentas. Fruit either capsular or succulent and indehiscent. Albumen fleshy. Embryo straight, often small.—Shrubs or small trees, terrestrial or epiphytic, with simple, usually alternating, penni-nerved or 3-nerved leaves. Flowers solitary and axillary, in short clusters or heads, or in terminal racemes or corymbs.

The succulent berries of several species, like bilberries, whortleberries, cranberries (all species of *Vaccinium*), are edible and pleasant, and so are those of the strawberry tree (*Arbutus unedo*) and other kinds. The young shoots and foliage of *Andromeda ovalifolia* are poisonous to goats, while those of *A. polifolia* affect sheep in a similar way. It is chiefly in *Rhododendreæ* that dangerous narcotic qualities are developed, and many of these produce symptoms of poisoning in man and cattle. Of the 16 or 17 species found in Burma none occur in the plains, but all at elevations above 3,000 feet.

* *Ovary inferior; fruit indehiscent, succulent.*

Calyx 4-5-toothed or -lobed or -cleft; corolla tubular, campanulate or urceolate; anther-cells produced in a shorter or longer tube; ovary-cells as many as corolla-lobes . . . . *Vaccinium.*

* * *Ovary superior.*

× Capsule dry, loculicidally opening.

Corolla globular to tubular-urceolate, with a 5-toothed reflexed limb; stamens 10, enclosed; the anthers shortly one-awned; stigma truncate; calyx dry in fruit . . . . . *Andromeda.*

Calyx 2-bracted at base; corolla ovate-urceolate, with a 5-cleft revolute limb; stamens 10, the anthers 2-cleft, the cells terminating in 2 awns; hypogynous scales 10, usually united at base; calyx fleshy and berry-like . . . . . *Gaultheria.*

× × Capsule dry, septicidally opening.

Corolla funnel- or bell-shaped, 5-cleft; stamens 5 or 10, declinate; anthers opening by terminal pores; hypogynous disk nectariferous. . . . . *Rhododendron.*

VACCINIUM, L.

Calyx adnate to the ovary, the limb 4- or 5-lobed. Corolla tubular-bell-shaped or urceolate, 4- or 5-lobed or -cleft. Stamens

twice as many as corolla-lobes, hypogynous; anthers adnate, 2-celled, nude or furnished with 2 bristles on the back, the cells more or less prolonged in a tube open at the apex. Epigynous disk cup-shaped, 5-lobed, or more or less cushion-like. Ovary 4- or 5-celled, the placentas more or less distinct and free, ascending, bearing numerous ovules on their margins. Berry more or less pulpy, 4- or 5-celled, often appearing 10-celled from the adherence of the walls of the thickened placentas. Seeds several in each cell, with a coriaceous or somewhat bony testa. Albumen fleshy. Embryo orthotrop, the radicle next the hilum.—Shrubs, often epiphytic, rarely small trees, with serrate or entire leaves. Flowers solitary or several together in the axils of the leaves, or in axillary racemes.

* *Flowers usually large, rarely small; corolla often tubular or bell-shaped; pedicels more than an inch long, thickened upwards and often cup-shaped dilated at the apex; berries turbinate-globular.—Epiphytical shrubs.*

× Flowers large, 1-2½ in. long, tubular to bell-shaped.

○ Filaments more than ½ in. long.

Anthers short, connate; corolla tubular; inflorescence glabrous . . *V. macrostemon.*

○○ Filaments short and thick, only 1-2 lin. long.

§ Calyx and pedicels glandular-hirsute.

Anthers without bristles between their tubes; corolla tubular or tubular-bell-shaped . . . . . *V. verticillatum.*

§§ Calyx and pedicels quite smooth.

† Anthers without a pair of reflexed or uncinnate bristles between their tubes.

Anthers exserted; nerves of leaves united into a marginal nerve; flowers about 2 in. long or longer, variegated . . . . *V. variegatum.*

As preceding, but flowers uniformly scarlet and only an inch or thereabouts long . . . . . *V. Roylei.*

Anthers included; nerves of leaves not confluent into a continuous marginal nerve . . . . . *V. miniatum.*

†† Anthers with a pair of bristles between their tubes at the base or half-way up.

Corolla tubular-bell-shaped; calyx toothed, the teeth subulate-lanceolate . . . . . *V. odontocerum.*

Corolla wide, bell-shaped; calyx-limb cup-shaped, with sinuate acute-teeth . . . . . *V. campanulatum.*

×× Flowers rather small, ½ in. to 2 lin. only long, urceolate to elongate-urceolate.

Corolla ½ an in. long, elongate-urceolate; flowers in peduncled terminal racemes . . . . . *V. auriculatum.*

Corolla 2 lin. long, urceolate; flowers in short umbel-like racemes arising laterally from the branches . . . . . *V. acuminatum.*

** *Flowers small, urceolate or urceolate-bell-shaped, on short thin pedicels thickened only at the very apex or not at all, forming elongate usually* 1*-sided racemes. Berries globose.*

× Racemes terminal, the bracts deciduous.—Epiphytic shrubs.

Branchlets pubescent; corolla villous at the mouth inside; anthers with 2 bristles at the tubes . . . . . *V. pumilum.*

×× Racemes axillary, the bracts deciduous.—Terrestrial shrubs or small trees.

All parts glabrous; pedicels, calyx, and corolla glabrous . . *V. Donianum.*
Young shoots and racemes, sometimes also the calyx, pubescent; corolla glabrous . . . . . *V. exaristatum.*

* *Flowers usually large, rarely small; corolla often tubular and bell-shaped; pedicels more than an inch long, thickened upwards and often cupular-dilated at the apex; berries turbinate-globular.—Epiphytical shrubs.*

1. **V. macrostemon,** Kz.—An evergreen epiphytical shrub, 2-4 ft. long, all parts glabrous; leaves almost sessile with a thick petiole-shaped base, obovate-lanceolate to lanceolate, rounded or obtuse at the base, 3-5 in. long, acuminate, coriaceous, entire, with the margins recurved, glabrous, the nerves thin, not united in a marginal nerve, the net-veination between them thin and lax; flowers scarlet, on slender glabrous pedicels, forming comparatively more or less elongate, glabrous, subulate-bracted racemes arising solitary or by pairs from above the scars of the fallen leaves; calyx glabrous, the limb cyathimorph with long subulate lobes; corolla about $1\frac{1}{4}$ in. long, glabrous, somewhat curved, tubular, the lobes linear-lanceolate, reflexed; filaments glabrous, slender, about $\frac{1}{2}$ an in. long or somewhat longer; anthers rather short, connate, smooth, the cells terminating into stiff tubes somewhat longer than the anthers themselves; berries spindle-like, ovoid, narrowed at the apex and crowned by the cyathimorph calyx-limb.

Hab.—Not unfrequent in the hill forests, especially the drier ones, of the Martaban hills east of Tounghoo, at 4,000 to 6,000 ft. elevation.—Fl. March.—s.

2. **V. verticillatum,** Kz., not Wight.—An evergreen epiphytical shrub, 2-3 ft. high, all parts glabrous; leaves obovate-lanceolate to almost cuneate-lanceolate, on a very thick and very short petiole or almost sessile, rounded or obtuse at the narrowed base, bluntish to shortly acuminate, $2\frac{1}{2}$-$3\frac{1}{2}$ in. long, coriaceous, entire or obsoletely and remotely serrate towards the apex, glabrous, the nerves uniting along the margins; flowers showy, scarlet or crimson, tubular, $\frac{3}{4}$-$1\frac{1}{4}$ in. long, on nearly an inch long glandular-hirsute pedicels, forming a few-flowered, short peduncled, umbel-like raceme, or by reduction of the peduncle solitary or in sessile few-flowered fascicles, axillary or from above the scars of the fallen leaves; calyx 5-toothed glandular-hirsute, the teeth lanceolate, acute, about a line long; corolla glabrous, 5-cornered, with linear-lanceolate blunt lobes; filaments nearly 2 lin. long; anthers about 3 lin. long, granular-tubercled, terminating in stiff tubes more than an inch long; stigma small, truncate or almost 5-lobed-peltate; berries glandular-hirsute, surrounded at the top by the calyx-limb and seated on the almost cyathiform-thickened joint of the pedicel.

Var. 1, **verticillatum proper:** corolla only about $\frac{3}{4}$ in. long; flowers in shortly peduncled umbel-like racemes.

Var. 2, **elegans**: corolla as in former, but the flowers solitary or by 2 or 3 in the axils of the leaves; leaves usually broader.

Var. 3, **grandiflorum**: corolla twice as long as in the preceding; flowers in short-peduncled or sessile umbel-like racemes, occasionally also solitary.

Hab.—Var. 2: not unfrequent in the upper dry forests of the Kambala ridges, Pegu Yomah, at 2,500 to 3,000 ft. elevation; var. 3: in the hill forests, especially the drier ones, of Martaban and Tenasserim, at 4,000 to 7,000 ft. elevation.—Fl. March.—l.

3. **V. variegatum**, Kz.—An evergreen epiphytical shrub, 2-3 ft. high, all parts glabrous; leaves from lanceolate to obovate-lanceolate, on a very short thick petiole or almost sessile, acute or obtuse at the base, 2-4 in. long, acute or shortly acuminate, coriaceous, obsoletely repand-serrate towards the apex, glabrous, the nerves uniting along the margins; flowers crimson or scarlet, or variegated, on long slender upwards cyathiform-thickened glabrous pedicels arranged in peduncled, glabrous, umbel-like racemes, or by reduction of the peduncle solitary or clustered in the axils of the leaves and above the scars of the fallen ones; corolla glabrous, 1-2 in. long or longer, tubular-bell-shaped, 5-gonous, with bluntish lobes; calyx glabrous, 5-cleft, the lobes oblong-lanceolate, nearly 2 lin. long, acute, often obscurely ribbed and penninerved; anthers granular-tubercled, on very short filaments, produced into $\frac{2}{3}$-$1\frac{1}{2}$ in. long tubes; stigma truncate; berries glabrous, red, crowned by the calyx-limb.

Var. 1, **macranthum**: flowers about 2 in. long or longer, variegated.

Var. 2, **Roylei** (*Thibaudia variegata*, Royle, *not* Roxb.): flowers only half so long, scarlet.

Hab.—Var. 1: Upper Tenasserim; var. 2: frequent in the hill forests of the Martaban hills, at 3,000 to 5,000 ft. elevation.—Fl. March; Fr. Apr.—l.

4. **V. miniatum**, Kz.—An evergreen epiphytical shrub, all parts glabrous; leaves oblong-lanceolate to oblong, on a very short thick petiole or almost sessile, rounded at the somewhat unequal base, 4-5 in. long, acute or acuminate, repand-serrulate, coriaceous, glabrous, the nerves numerous and prominent beneath, not forming a continuous marginal nerve, the net-veination lax and strong; flowers scarlet, in short-peduncled, glabrous, umbel-like corymbs or few together clustered, arising from the axils of the leaves or more frequently from the stems; calyx glabrous; corolla glabrous, 5-gonous, about $\frac{3}{4}$ in. long, with short linear acute lobes; filaments very short; anthers included in the tube, granular-tubercled, somewhat shorter than the straight nude tubes.

Hab.—Burma, probably Ava hills.

5. **V. odontocerum,** Wight.—An evergreen epiphytical shrub, all parts glabrous, the branchlets more or less angular; leaves oblong-lanceolate to lanceolate, on a very short and thick petiole, acute or obtuse at the base, 3-5 in. long, acuminate, coriaceous, glabrous, obsoletely repand-serrulate, the nerves thin, forming a sub-marginal nerve along the borders, the net-veination prominent, but lax; flowers scarlet, drooping, on slender glabrous pedicels, forming a sessile cluster or glabrous raceme in the axils of the leaves or arising from the branches; calyx glabrous, the teeth linear-subulate; corolla about an inch long, variegated, glabrous, 5-gonous, tubular-bell-shaped, the lobes linear-lanceolate, rather long and reflexed; filaments short; anthers exserted, granular-tubercled, the cells terminating into long stiff tubes with 2 refracted bristles between each pair about half-way up on the back.

Hab.—Ava hills, adjoining Assam.—Fl. March.

6. **V. campanulatum,** Kz.—An evergreen epiphytical shrub, all parts glabrous, the branches somewhat angular; leaves from obovate-oblong to lanceolate, on a very short and thick petiole or almost sessile, acute or obtuse at the base, 2-3 in. long, blunt or bluntish acuminate with a mucro, coriaceous, entire or nearly so with recurved margins, glabrous, the nerves thin and forming no marginal nerve, the net-veination thin and lax; flowers scarlet, often variegated, on slender glabrous pedicels, forming a short, slender, glabrous raceme usually arising from the branches; calyx glabrous, the limb cyathiform, sinuately and sharply 5-toothed; corolla glabrous, about ½ an in. long or somewhat longer, 5-angular, bell-shaped, with long lanceolate-acuminate reflexed lobes; filaments very short; anthers granular-tubercled, the cells terminating into stiff tubes somewhat longer than the anther and furnished with a pair of refracted bristles just at the base of the back.

Hab.—Martaban, not unfrequent in the stunted hill forests near the top of Nattoung, at about 7,000 ft. elevation.—Fl. March.—s.

7. **V. auriculatum,** Kz.—An evergreen epiphytical shrub, all parts glabrous; leaves oblong to elliptically oblong, almost sessile with a rounded base, 3-4 in. long, acuminate, entire, coriaceous, glabrous, the nerves thin and united into a marginal nerve, the netveination thin and lax; flowers on nearly 2 in. long glabrous red pedicels forming peduncled glabrous long racemes at the end of the branches or in the axils of the upper leaves; calyx glabrous, seated on the broadly cyathiform apex of the pedicel, truncate at the base, the lobes linear, nearly twice as long (2 lin. long) as the tube; corolla crimson with a greenish limb, tubular-urceolate, slightly 5-angular, glabrous, about ½ an in. long, the lobes short; filaments very short, ciliate at the apex; anthers granular-tubercled,

the cells terminating into stiff tubes nearly twice as long as the anthers themselves; berries the size of a large pea, glabrous, seated on the enlarged cyathiform entire apex of the pedicel, crowned by the rather stiff calyx-lobes.

Hab.—In the hill forests of Martaban, above 4,000 ft. elevation.—Fl. March.

8. **V. acuminatum,** Kz.—An evergreen shrub, apparently epiphytical, all parts glabrous, the branchlets angular; leaves lanceolate to narrow ovate-lanceolate, acuminate at the base and decurrent on the short petiole, 4-6 in. long, long-acuminate, remotely crenate-serrate, thick-chartaceous or coriaceous, glabrous, the nerves thin, not united in a marginal nerve; flowers small, scarlet, on long, slender, glabrous red pedicels, forming short, glabrous, short-peduncled racemes above the scars of the fallen leaves; calyx glabrous, the teeth broadly triangular-acute; corolla oval-urceolate, terete, about 2 lin. long or somewhat longer, glabrous, the short bluntish lobes reflexed; filaments nearly as long as the slightly granular-wrinkled anthers; anther-cells terminating into rather broad tubes of their own length; berries glabrous, crowned by the calyx-limb.

Hab.—Burma, probably Moulmein hills.

* * *Flowers small, urceolate or urceolate-bell-shaped, on short thin pedicels usually not thickened at the apex, forming elongate usually* 1*-sided racemes; corolla usually terete; anther-tubes usually short; berries globose.*

9. **V. pumilum,** Kz.—An evergreen, small, much-branched epiphytical shrub, the branchlets pubescent; leaves oblong to oblong-lanceolate, on a very short puberulous petiole, acute at the base, about an inch long or shorter, bluntish, minutely crenate, thick-coriaceous, glabrous, pale-coloured (in a fresh state white) beneath, the nerves obsolete; flowers small, on very short puberulous pedicels forming pubescent bracted racemes solitary or by twos at the end of the branchlets; bracts deciduous, white, large, ovate, ciliate and puberulous, membranous; calyx pubescent, the teeth oblong-lanceolate, acute, ciliate; corolla about 2 lin. long, oblong-urceolate, pale rose-coloured, 5-angular, glabrous outside, inside, especially at the mouth, densely villous, the lobes short, reflexed; filaments short, filiform, pilose, bearded at the apex; anthers glabrous, the cells terminating into short lanceolate-subulate tubes bearing 2 bristles between them towards the base; berries small, purple, glabrous, crowned by the calyx-limb.

Var. 2, **cuneata**: leaves of a thinner texture, obovate-cuneate to cuneate, rounded or blunt at the apex; flowers longer pedicelled.

Hab.—Frequent on trees of the drier hill forests of the Martaban hills, at 5,000 to 6,000 ft. elevation; var. 2: on the same hills, at 4,000 ft. elevation.—Fl. Fr. March.—l.

10. **V. Donianum,** Wight.—An evergreen large shrub, all parts glabrous; leaves from lanceolate to oblong-lanceolate and oblong, acute at the base, on a short glabrous petiole, 2-3 in. long, acuminate to acute, serrulate, glabrous, rigidly chartaceous, penninerved without marginal nerve, the net-veination lax; flowers small, on 1-1½ lin. long glabrous pedicels, forming slender, glabrous, bractless axillary racemes; calyx glabrous, the lobes triangular, acute; corolla white or rose-coloured, 3-3½ lin. long, oblong-urceolate, glabrous, the lobes bluntish, short, reflexed; filaments pilose, dilated at the base; anthers smooth, without or with bristles at the long tubular appendages; berries globular, glabrous, crowned by the calyx-limb.

Hab.—In the drier hill forests, especially the pine forests, of the Martaban hills, at 3,000 to 6,000 ft. elevation.—Fl. Jan.-Feb.; Fr. March.—SS.= Metam.

11. **V. exaristatum,** Kz.—An evergreen tree (20—25 + (?) + 1—2) or a large shrub, the young shoots all shortly and softly pubescent; leaves from oblong-lanceolate to oblong-ovate, on a shortly pubescent short petiole, acute or bluntish at the base, 1½-2½ in. long, acute or shortly acuminate, serrulate, chartaceous, while young sparingly pubescent beneath, soon glabrous, penninerved and slightly net-veined without marginal nerve; flowers white, on 1-1½ lin. long puberulous pedicels, forming a slender, puberulous, one-sided raceme in the axils of the leaves, the bracts crimson, deciduous before expansion of the flowers; calyx puberulous or almost glabrous, the lobes triangular, acute; corolla 2-2½ lin. long, glabrous, urceolate, the short lobes reflexed; filaments pilose, dilated at the base; anthers terminating into short tubes, destitute of bristles; berries globular, red, glabrous, crowned by the calyx-limb.

Hab.—Common in the drier hill forests of the Martaban hills, at 5,000 to 6,000 ft. elevation.—Fl. March.—l.—SS.=Metam.

ANDROMEDA, L.

Calyx 5-parted, the lobes acuminate. Corolla from globose to cylindrically urceolate, with a contracted 5-toothed more or less reflexed limb. Stamens 10, included; filaments hardly dilated at the base, with 2 bristles at the summit; anthers dehiscing longitudinally and at the top, the cells not produced into tubes, but terminated by a bristle or short point. Ovary 5-celled, the cells with numerous ovules attached to the axial thick placentas; style thick, 5-gonous, truncate or 5-toothed. Capsule 5-celled and loculicidally

5-valved, with numerous minute scopiform seeds in each cell.—Small trees or shrubs or undershrubs, with alternate penninerved leaves. Flowers usually small, in one-sided, elongate, axillary racemes.

1. **A. ovalifolia,** Wall.; Brand. For. Fl. 210.—A tree (23—35 + (?) + 2—3), usually stunted and crooked, shedding leaves in C.S., the younger parts pubescent, but soon turning more or less glabrous; leaves ovate to ovate-oblong and oblong-lanceolate, rounded or obtuse at the base, 2½-3½ in. long, on a glabrescent petiole 2-3 lin. long, shortly acuminate, entire, rigidly chartaceous, glabrous, or usually slightly pubescent on the nerves beneath and sprinkled with minute brown scales; flowers rose-coloured or white, on 1-2 lin. long or somewhat longer strong pedicels, forming slender, 1-sided, puberulous but glabrescent racemes at the end of the branchlets; calyx puberulous, the lobes ovate, acute; corolla nearly 4 lin. long or somewhat longer, minutely pubescent outside, oblong-urceolate, the limb 5-toothed, hardly reflexed; filaments long, pubescent; anthers opening by a terminal slit; capsules depressed-globular, 5-cornered and 5-valved, glabrous.

Hab.—Common in the drier (especially the stunted) hill forests of Martaban, at 5,000 to 7,000 ft. elevation.—Fl. Fr. March.—l.—SS.=Metam.

GAULTHERIA, Kalm.

Calyx 5-lobed, somewhat enlarging with ripening of the fruit and turning more or less fleshy. Corolla ovoid-urceolate, often contracted at the 5-toothed mouth. Stamens 10, included; filaments often villous; anthers 2-cleft, 2-celled, the cells produced into 2 bristles (anthers therefore 4-aristate). Hypogynous scales 10, distinct, or usually united at the base. Ovary 5-celled, the cells with numerous ovules along the axial placentas. Capsule depressed globular, enclosed in the more or less fleshy calyx, and appearing, therefore, berry-like, 5-gonous and loculicidally 5-valved.—Shrubs or small trees, with alternate toothed or entire leaves. Flowers or bracteoled pedicels arranged in shorter or longer usually one-sided axillary or terminal racemes.

1. **G. punctata,** Bl.—An evergreen shrub, often growing out into a stunted crooked tree up to 25 ft. high, but as often reduced to a little at base simple-stemmed shrub of only 2-3 ft. high, all parts glabrous, the branchlets sharply angular; leaves oblong to oblong-lanceolate and obovate, on a longer or shorter glabrous usually red petiole, acute at the base, 2-3 in. long, acute to blunt, more or less serrulate, especially towards the apex, coriaceous, glabrous, beneath greenish white and more or less glandular-dotted, the midrib and nerves strong and red-coloured, the transverse veination

lax; flowers small, white, 2-bracted at the base, on 1-2 lin. long puberulous glabrescent pedicels, forming rather robust, puberulous, glabrescent racemes in the axils of the leaves and crowded at the end of the branchlets; calyx-lobes ovate, acute, slightly puberulous; corolla 2-2½ lin. long, ovoid-urceolate, glabrous outside, villous or almost glabrous within, the very short lobes reflexed; ovary villous; capsule depressed-globular, pubescent, more or less covered by the fleshy bluish-black calyx.

HAB.—Common in the drier, especially the stunted, hill forests of Martaban, at 6,000 to 7,000 ft. elevation.—Fl. Feb.; Fr. March.—l.—SS.=Metam.

RHODODENDRON, L.

Calyx 5-parted, -toothed, or quite entire and shortened. Corolla from funnel- and bell-shaped to rotate, regular or somewhat irregular, 5- rarely 7-lobed. Stamens usually twice as many, rarely as many, as corolla-lobes, or numerous (up to 20), free, often declinate, exserted; anthers opening by two apical pores. Ovary 5- or 10-celled, the cells with numerous ovules attached to the axial placentas. Capsule 5- or 10-celled and -valved, dehiscing septicidally. Seeds numerous, compressed scopiform.—Small trees or shrubs, sometimes epiphytic, with alternate or almost whorled leaves. Flowers usually showy, in umbel-like terminal racemes or solitary or few together in the axils of the upper leaves.

○ *Leaves shortly appressed-tomentose or lepidote beneath; calyx inconspicuous.*

Leaves silvery and shortly tomentose beneath; ovary rusty-puberulous; bracts of leaf-buds vilious; tree . . . . *R. arboreum.*

Leaves rusty-lepidote beneath; ovary and style rusty-lepidote; bracts of leaf-buds only silky-ciliate; shrub . . . . *R. formosum.*

○○ *Leaves glabrous and smooth.*

Ovary and style quite glabrous; bracts of leaf-buds minutely ciliate . . . . . *R. Moulmeinense.*

1. **R. arboreum,** Sm.; Bedd. Sylv. Madr., t. 228; Brand. For. Fl. 281.—An evergreen tree (20—30 + (?) + 2—3), the branchlets glabrous, the imbricately scaled large leaf-buds often a little appressed-pubescent; leaves elliptical to obovate-elliptical and oblong, acute or obtuse at the base, on a strong, glabrous petiole up to ½ an in. long, acute or rather bluntish, entire, 4-5 in. long, coriaceous, glabrous above, beneath appressed silvery-tomentose, the strong lateral nerves more or less glabrescent; flowers showy, scarlet, on shortly pubescent longer or shorter pedicels, forming terminal, sessile, umbel-like racemes protected by very deciduous, large, villous-pubescent bracts; calyx very short and inconspicuous, 5-toothed; corolla campanulate-funnel-shaped, about an inch long or somewhat longer, the lobes ovate, blunt; filaments slender, glabrous; ovary rusty-puberulous;

capsules rather woody, about ½ an in. long, oblong, thick and a little curved, glabrescent.

Hab.—In the hill forests of the Karenee hills, north-east of Tounghoo.

2. **R. formosum,** Wall.—An evergreen shrub, 2-3 ft. high, the branchlets and young parts covered with spreading tawny or brown hairs; leaves oblong to obovate-lanceolate, acute or obtuse at the base, on a thick, somewhat hairy petiole 2-3 lin. long, 2-2½ in. long, acute, entire, coriaceous, glabrous, and somewhat wrinkled above or sprinkled with spreading tawny hairs, beneath rusty-coloured from numerous roundish rusty-coloured scales, the lateral nerves little conspicuous; bracts of the leaf-buds broadly ovate, blunt, glabrous, silky-white ciliate; flowers large and showy, white, somewhat rose-coloured outside, on nearly ½ an in. long rusty-scaly pedicels, forming by 3 or 4 a sessile umbel-like raceme at the end of the branchlets, protected by very deciduous, oblong, glabrous bracts; calyx short, 5-lobed, the lobes short, 3-angular, hirsute-ciliate; corolla 1½ to nearly 2 in. long, funnel-shaped, 5-lobed, sprinkled with silvery very fugaceous scales at the outside, the lobes large, oblong, blunt, waved or almost curled; ovary scaly and shortly hispid, the style and filaments scaly towards the base; capsules rather woody, about ½ an in. long or somewhat longer, oblong, blunt, rusty-brown, rough from a very short indistinct tomentum.

Hab.—Martaban, in the stunted hill forests on the top of the Nattoung, above 7,000 ft. elevation; also Moulmein hills.—Fl. March.—l.—SS.=Metam.

3. **R. Moulmeinense,** Hook.—An evergreen tree (30—40 + 10—15 + 3—4), all parts glabrous; bark rough, reddish; leaves lanceolate to oblong and oblong-lanceolate, acute or obtuse at the base, 2-4 in. long, shortly and bluntish acuminate, entire, thin-coriaceous, glabrous and smooth, the nerves all thin, arising almost rectangularly from the midrib; bracts of leaf-buds small, glabrous, minutely ciliate; flowers white, on glabrous up to an inch long pedicels, forming a sessile terminal umbel protected by very deciduous small bracts; calyx very small and inconspicuous, obsoletely 5-toothed; corolla 1½ to nearly 2 in. in diameter, funnel-shaped, glabrous, the lobes oblong, blunt; ovary and style quite smooth; filaments at the base shortly puberulous; capsules linear-oblong, glabrous.

Hab.—Common in the hill forests, especially the damper ones, from Martaban down to Tenasserim, at 4,000 to 7,000 ft. elevation.—Fl. March.—s.—SS.=Metam.

Remarks.—Wood white, soft.

EPACRIDEÆ.

Flowers regular, hermaphrodite. Calyx of 5, rarely 4, distinct sepals, much imbricate in bud. Corolla with a cylindrical bell-shaped

or urceolate tube, the limb 5- rarely 4-lobed, valvate or variously imbricate, rarely the petals all distinct. Stamens as many as corolla-lobes or rarely fewer, hypogynous and free, or more or less adnate to the corolla-tube; anthers versatile or rarely adnate, 1-celled (more or less perfectly 2-celled before dehiscence), opening by a single longitudinal slit into 2 valves, leaving no or only a thin, slightly prominent, longitudinal dissepiment. Hypogynous disk annular or cupular, entire, lobed, or consisting of 5 distinct scales, rarely wanting. Ovary superior, 5- or fewer- rarely 6-10-celled, the cells with a solitary or several pendulous ovule; style simple, terminal or spuriously lateral, rarely almost basal; stigma small, capitate or peltate, rarely slightly lobed. Fruit in the 1-ovuled genera indehiscent and more or less drupaceous, capsular and loculicidally dehiscing in the several-ovuled ones. Embryo terete or nearly so, much shorter than the albumen, the radicle next the hilum.—Shrubs or rarely trees, with opposite or seldom opposite, often crowded or imbricate rigid leaves. Flowers axillary or terminal, either solitary on imbricate-scaled or bracted peduncles, or in spikes or racemes.

An almost exclusively Australian order of little importance. Only a very few species have been found in the Indian Archipelago and Malaya.

LEUCOPOGON, R. Br.

Corolla-tube longer or shorter than the calyx, without tufts of hairs or scales below the middle, densely bearded inside, the lobes valvate. Filaments inserted near the mouth of the corolla, short, filiform; anthers wholly or partially included. Hypogynous disk cup-shaped, truncate, 5-toothed or -lobed or of 5 distinct scales. Ovary usually 2-3- or 5- (very rarely 1- or 6-10) -celled, the cells 1-ovuled; style short or long. Fruit a drupe, the mesocarp sometimes pulpy, but usually thin, the endocarp crustaceous or hard.—Shrubs, with usually small rigid leaves. Flowers small, in terminal or axillary small spikes or the spikes reduced.

1. **L. Malayanus,** Jack.—An evergreen, small, rigid shrub, all parts glabrous; leaves linear-lanceolate to lanceolate, sessile, narrowed at both ends, very acute or mucronate, entire, 1-2 in. long, rigidly coriaceous, obscurely parallel-nerved, glossy above, more or less glaucous beneath; flowers small, white, sessile, between 2 ovate, acute, concave bractlets, forming small, short ($\frac{1}{4}$-$\frac{1}{2}$ in. long), simple, solitary puberulous spikes in the axils of the leaves; sepals rigidly coriaceous, oblong-lanceolate, about a line long, minutely ciliate; corolla funnel-shaped, a little longer than the calyx, puberulous, 5-cleft, the lobes lanceolate, bearded above the base; hypogynous scales 5, distinct, erect, blunt; style villous, the stigma almost globular; drupe sappy, almost globular, the putamen usually 5-celled.

Var. 1, **Malayanus proper:** leaves larger and broader, 1½-2 in. long, mucronate-acute; spikes about ½ in. long.

Var. 2, **Moluccanus** (*L. Moluccanus*, Scheff.): leaves ½-1 in. long, 1½-2½ lin. broad, subulate-pointed; spikes only 1½-2 lin. long.

Hab.—Var. 1: Burma, probably Southern Tenasserim; var. 2: Tenasserim.

PLUMBAGINEÆ.

Flowers hermaphrodite, regular. Calyx tubular, often enlarged and scarious, or petal-like at the apex, with 5 prominent ribs usually ending into as many teeth. Corolla of 5 petals free or more or less united, twisted-imbricate in bud. Stamens 5, inserted at the base of the corolla or petals, opposite, and often more or less adnate to them; anthers versatile, 2-celled, the cells opening in longitudinal slits. Ovary 1-celled, with a solitary ovule suspended from a filiform placenta erect from the base; styles 5, distinct or united at the base. Capsule 1-seeded, not or irregularly dehiscing. Seed solitary with a thin testa. Albumen rarely abundant, usually scanty or none. Embryo straight, with a superior radicle.—Herbs or rarely undershrubs or pygmæan trees, with radical or alternate, entire or lobed leaves. Flowers in terminal heads, spikes or panicles.

A small order of very different medicinal qualities, but of no special interest to the forester. *Plumbago rosea, Zeylanica Europæa,* and other species act as a vesicatory; the roots of *Statice Caroliniana* is one of the most powerful astringents. Only 3 species are known to me from Burma.

ÆGIALITIS, R. Br.

Calyx tubular, glabrous, with 5 prominent ribs ending in as many short teeth with induplicate margins. Petals slightly cohering at the base. Stamens adhering to the base of the petals. Ovary 1-celled; styles free or scarcely cohering at the base; stigma small, capitate. Fruit narrow, elongate and exserted, 1-seeded. Albumen none. Embryo divided to near the middle into linear cotyledons enclosing a linear-conical plumule.—Pygmæan trees or rather simple-stemmed shrubs, with long-petioled broad leaves. Flowers nearly sessile, in dichotomous panicles.

1. **Æg. annulata,** R. Br.—An evergreen treelet (6—7 + 3—4 + ¼—⅕), the trunk downwards conically thickened, all parts glabrous; leaves from broadly oval to almost orbicular, on a sheathing 1 to nearly 3 in. long petiole, blunt or nearly so, about 2-3 in. across, entire, coriaceous, thinly parallel-nerved; flowers small, pale yellow almost sessile and solitary between erect concave bracts nearly as

long as the 3-3½ lin. long, 5-ribbed calyx, forming axillary and terminal panicled racemes; corolla somewhat longer than the calyx, the lobes narrow; fruit linear, incurved, 5-angular, 1½ in. long, with a thinly coriaceous glossy pericarp; seed of the shape of the fruit.

Hab.—Frequent in the littoral, especially the tidal, forests all along the shores from Chittagong and Arracan down to Tenasserim and the Andamans.—Fl. Fr. C.S.—l.—SS.=Sal.

MYRSINEÆ.

Flowers regular, hermaphrodite, polygamous or dioecious. Calyx 5- or rarely 4- or 6-lobed or -toothed, free or rarely adnate to the ovary, the lobes contorted or very rarely valvate in bud. Corolla tubular-bell-shaped or rotate, more or less divided into as many lobes or rarely distinct petals as there are divisions to the calyx, usually imbricate and often contorted. Stamens as many as corolla-lobes and opposite to them, all fertile or rarely alternating with as many staminodes; filaments usually very short, free or rarely connate; anthers 2-celled, the cells opening by longitudinal slits, or rarely on the summit, sometimes chambered. Ovary free or adnate to the calyx, 1-celled, the cells with several (usually ovoid or turbinate) ovules attached to, or immersed in, a central placenta, which is usually quite free, thick, and globular; style simple, with a simple capitate or rarely lobed stigma. Fruit an indehiscent berry or drupe, or very rarely splitting lengthwise on one side. Seeds several, or usually solitary, with a thin testa. Albumen horny or almost fleshy, or rarely none. Embryo filiform, usually curved, the radicle longer than the semi-convex cotyledons.—Trees or shrubs, rarely undershrubs, sometimes scandent, the soft parts often marked with resinous dots, with alternate simple leaves. Stipules none. Flowers small, in axillary clusters, racemes or panicles, or rarely in terminal panicles.

All the Burmese species of this order are woody, but none of them are of any special interest or importance to the forester, neither do any of the species possess medicinal properties worth mentioning.

* *Stamens 5; anthers usually not transversely chambered; fruit an indehiscent berry or drupe; seeds with albumen.*
  × Ovary and fruit inferior or nearly so; corolla bell-shaped or nearly so . . . . . *Mæsa.*
  × × Ovary and drupe superior.
    \+ Corolla consisting of 5 or 4 free petals; climbers . *Embelia.*
    \+ + Corolla gamopetalous.—Usually erect trees or shrubs.
Ovules few only . . . . . *Myrsine.*
Ovules numerous . . . . . *Ardisia.*

* * *Stamens 5; anther-cells transversely chambered; fruit a dry cylindrical follicle-like curved drupe, rupturing irregularly; seeds elongate, geminating already on the tree; albumen none* . . . . . *Ægiceras.*

MÆSA, Forsk.

Calyx adnate to the ovary, 5-lobed, imbricate in bud. Corolla almost bell-shaped, 5-cleft, the lobes blunt, with inflexed tips. Stamens 5, free; anthers cordate, shorter than the filiform filaments. Ovary inferior or half-inferior, 1-celled, with several ovules attached to the basilar placenta; style short, with a capitate or capitately 3-5-lobed stigma. Berry small, crowned by the calyx-limb, several-seeded.—Trees or shrubs, with alternate pellucid-dotted leaves. Flowers small or minute, 2-bracteoled, in simple or compound, axillary, or rarely terminal racemes. Bracts usually very small.

* *All parts, also the inflorescence, quite glabrous.*

× Racemes very short (hardly as long as the petiole); leaves inconspicuously and remotely callose-toothed; branchlets minutely warted . . . . . *M. verrucosa.*

×× Racemes panicled, very much longer than the petioles.

○ Leaves entire; compound racemes shorter than the leaves . . . . . *M. ramentacea.*

○○ Leaves coarsely serrate.

Compound racemes shorter than the leaves; calyx only ⅓ lin. long *M. Indica.*

Compound racemes very slender, as long or longer than the leaves; calyx nearly a line long . . . . . *M. paniculata.*

* * *Inflorescence, and also the softer parts and leaves, pubescent or otherwise hairy; leaves sinuately toothed.*

Leaves, especially beneath, softly pubescent; flowers in dense rusty-pubescent panicles or clusters, shorter than the petiole; bracts minute . . . . . *A. mollissima.*

Leaves glabrous, except the sparingly hairy rib beneath; flowers in moss-like densely rusty-hairy panicles much longer than the petioles; bracts about as long as the pedicels . . . . *M. muscosa.*

* *All parts, also the inflorescence, quite glabrous.*

1. **M. verrucosa,** Scheff.—An evergreen small tree, all parts glabrous, the branchlets verrucose; leaves from elliptically lanceolate to ovate-oblong, on a slender petiole 6-8 lin. long, somewhat tapering at the base, 3-5 in. long, acuminate, obsoletely repand and the thin lateral nerves excurrent into minute tooth-like callosities, glabrous, thin-coriaceous, rather glossy; flowers minute, on ½ a line long, afterwards a line long, rather strong pedicels, forming a solitary or several short, glabrous, rather robust racemes in the axils of the leaves and of about the length of the petiole; bracts and bractlets minute, much shorter than the pedicels; calyx about a line long, ovoid-oblong, glabrous, the lobes ovate-oblong, somewhat acute, connivent; ovary almost inferior; young berries ovoid-oblong, crowned by the calyx-limb.

Hab.—Rather rare in the moister upper mixed forests of South Andaman.—Fl. May-June.—s.—SS.=SiS.

2. **M. ramentacea,** Roxb.—An evergreen tree (25—30 + (?) + 1—1½), all parts quite glabrous, the branchlets smooth; bark about a line thick, greyish brown, even, with longitudinal brown fissures; cut greenish; leaves from ovate-oblong to ovate-lanceolate, on a 4-6 lin. long petiole, rounded or obtuse at the base, 4-7 in. long, acuminate, quite entire, pergamaceous, smooth, glossy above; flowers minute, yellowish white, on slender ½ to nearly a line long pedicels, racemose, forming slender glabrous panicles in the axils of the leaves and at the end of the branchlets, or lateral and shorter than the leaves; bracts small, subulate, rusty-coloured; calyx ½ a line long, glabrous, deeply 5-lobed, the lobes broadly ovate, somewhat acute; bractlets almost conform with the calyx-lobes, but smaller; corolla almost rotate with a very short tube, the lobes almost rotundate, veined; ovary nearly superior, with many ovules in it; berries quite inferior, crowned by the calyx-limb and style, the size of a large mustard-seed, white, smooth, succulent, containing a single, pretty hard, but thin, several-seeded nut.

Hab.—Common in the moister, upper mixed, and the moist evergreen forests, all over Burma from Chittagong, Pegu, and Martaban down to Tenasserim and the Andamans; occurring also in poonzohs, and here often in great number.—Fl. Jan.; Fr. March-Apr.—s.—SS.=Lat. p. Metam. SiS., etc.

Remarks.—Wood pale brown or brown, rather heavy, close-grained, brittle.

3. **M. Indica,** DC.; Bedd. Sylv. Madr. 137, t. 18, f. 4; Brand. For. Fl. 283.—An evergreen small tree, 8 to 15 ft. high, or large shrub, all parts glabrous; leaves from lanceolate to oblong-lanceolate, usually tapering at the one side into a 3-4 lin. long petiole, 3-6 in. long, acuminate, coarsely serrate, glabrous, the nerves beneath strong and prominent; flowers minute, white, on ½-1 lin. long pedicels, forming compound, rarely simple, slender, glabrous racemes in the axils of the leaves and above the scars of the fallen ones; bracts and bractlets minute, linear-lanceolate, acute, shorter than the pedicel; calyx about ⅓ lin. long, glabrous, the lobes broadly ovate, acute; corolla almost rotate, with a short tube, the lobes rounded; ovary half-superior; berries the size of a pepper-kernel, globular, dry and smooth, crowned by the persistent calyx-limb and containing a single nut of numerous angular seeds.

Hab.—Not unfrequent in the tropical forests along the eastern slopes of the Pegu Yomah and Martaban down to Tenasserim, up to 3,000 ft. elevation; also Chittagong.—Fl. March.—s.—SS.=Metam. SiS., etc.

4. **M. paniculata,** A. DC.—An evergreen shrub or climber (?), all parts quite glabrous; leaves oblong to elliptically oblong, on a ½-¾ in. long petiole, rounded or obtuse at the base, 3-6 in. long, shortly acuminate, coarsely repand-toothed, thin pergamaceous, glabrous, the nerves beneath strong and prominent; flowers white, small, on 1-2 lin. long pedicels, forming long, slender, glabrous, compound

racemes in the axils of the leaves and usually longer than them, arranged at the end of the branchlets into elongate slender panicles; bracts and bractlets linear-subulate, shorter than the pedicels; calyx nearly a line long, glabrous, the lobes ovate, blunt; corolla bell-shaped, somewhat longer than the calyx-lobes, the lobes blunt; ovary half-inferior; berries said to be ovoid, hardly a line long.

Hab.—Tenasserim.—Fl. Dec.

* * *Inflorescence, and usually also the softer parts and leaves, pubescent or otherwise hairy.*

5. **M. mollissima,** Wall.—An evergreen slender-branched or almost simple shrub, 4-6 ft. high, all softer parts softly pubescent from rusty-coloured (in a fresh state whitish) short hairs; leaves lanceolate and elliptically-lanceolate to broadly oblong, on a densely rusty-pubescent petiole ½-1 in. long, 6-8 in. long, shortly but finely acuminate, sinuate-toothed, thick membranous, above sparingly and inconspicuously, beneath softly and shortly, pubescent, the nerves strong, rusty-coloured, excurrent into short callose teeth; flowers white, minute, very shortly pedicelled, in short almost clustered racemes, or forming a contracted, densely rusty-tomentose, short panicle in the axils of the leaves and much shorter than, or hardly, if ever, as long as, the petioles; bracts minute, shorter than the pedicels; calyx longer than the pedicel, about a line long, densely rusty-pubescent, the lobes ovate, acute; corolla tubular-bell-shaped, glabrous, about twice as long as the calyx, the lobes very short and rotundate, 4 of them spreading, the upper one bent inwards; ovary almost inferior, the style short and thickened with an indistinctly lobed stigma.

Hab.—Not unfrequent in the tropical forests along the eastern slopes of the Pegu Yomah and of Martaban.—Fl. March-Apr.—s.—SS.=Metam. SiS.

6. **M. muscosa,** Kz.—An evergreen shrub, the branches terete, smooth and glossy; leaves oblong to obovate-oblong, acute or acuminate at the base, on a strong, sparingly puberulous petiole ½ to 1 in. long, 5-7 in. long, shortly acuminate, coarsely sinuate-toothed, thin-pergamaceous, glabrous, the midrib sparingly and minutely pubescent, the nerves excurrent into callose blunt teeth; flowers minute, on very short pubescent pedicels, in short racemes forming branched, mossy, densely and shortly rusty-hairy panicles in the axils of the leaves and 2 to 3 times as long as the petiole; bracts longer than the pedicels, about a line long, shortly rusty-hirsute, linear, acuminate; calyx rusty-hirsute, nearly a line long, the lobes ovate-lanceolate, acute; corolla tubular-bell-shaped, glabrous, twice as long as the calyx, the lobes short and rotundate; ovary almost inferior, style not exceeding the calyx-lobes.

Hab.—Burma; no locality.

EMBELIA, Burm.

Calyx more or less deeply 5-cleft or -parted, the lobes convolute in bud. Petals 5, distinct from the base, imbricate. Stamens 5; the filaments opposite to the petals and at the base adnate to them, filiform or thick; anthers much shorter than, or as long as, the filaments, ovoid, the cells ovate, opening by a longitudinal slit and almost divided into 2 by a longitudinal nerve. Ovary usually minute, 1-celled, with 4 to 1 ovules attached to the minute or obsolete central placenta; style short, with a capitate and obscurely lobed stigma. Drupes globular, containing a 1-seeded thin-walled nut.—Scandent shrubs, with usually entire leaves. Flowers minute, often (by abortion of the pollen or the ovules) almost dioecious, in axillary racemes or terminal panicles.

× *Inflorescence terminal, or terminal and axillary; filaments short and thick; leaves glabrous; flowers 5-merous.*

Branchlets and inflorescence greyish or tawny-velvety or puberulous; flowers on terete pedicels . . . . . *E. Ribes.*

As former, but the velvety pubescence always greyish; flowers sessile . . . . . *E. sessiliflora.*

All parts, also the inflorescence, quite glabrous; pedicels 4-cornered *E floribunda.*

× × *Inflorescence axillary only; filaments longer than the anthers, slender and filiform; young shoots and leaves beneath more or less pubescent, at least along the midrib, rarely glabrous.*

○ Flowers 5-merous.—Erect or scandent large shrubs.

† Leaves long-petioled.

Leaves 3-5 in. long; racemes elongate; pedicels short . . . *E. robusta.*

Leaves 2-2½ in. long; racemes short; pedicels very long and slender . . . . . *E. vestita.*

†† Leaves almost sessile, ½-1 in. long, not pellucid-dotted; racemes very short and almost umbel-like. *E. parviflora.*

○○ Flowers 4-merous; leaves ½-1 in. long, serrately 3-toothed at the apex, glabrous, conspicuously gland-dotted beneath; racemes very short and almost umbel-like . . . . . *E. myrtillus.*

1. **E. Ribes,** Burm.; Brand. For. Fl. 284.—An evergreen scandent shrub or rather an arboreous climber, in dry ground often remaining semi-erect, the young shoots minutely puberulous, the stem from an in. to 2 ft. in girth; bark thin, brown, fibrous; leaves elliptical to oblong, on 3-4 lin. long callose-bordered petioles, bluntish apiculate, 1½-3 in. long, entire, pergamaceous, glabrous, the nerves and veins numerous and thin; flowers minute, white, on 1-1½ lin. long puberulous pedicels, in slender velvety racemes, forming slender, greyish or tawny-velvety panicles in the axils of the upper leaves and at the end of the branchlets; bracts subulate, minute and hardly ⅓ lin. long; calyx puberulous, the lobes broadly 3-angular, short, acute; petals oblong, rather acute, thick, nearly a line long,

densely puberulous; drupes the size of a pepper-kernel, globular, black, succulent, crowned by the style, 1-seeded.

Var. 1, **Ribes proper**: leaves destitute of hollow glands; flowers in racemose panicles.

Var. 2, **glandulifera** (*E. glandulifera, Wight.*): leaves bearing many or fewer hollow glands along or near the midrib; flowers often in simple axillary racemes, and only at the end of the branchlets panicled.

Hab.—Var. 1: frequent in the tropical forests of Martaban and Upper Tenasserim; also Chittagong.—Fr. March.—s.—SS.=Metam.

2. **E. sessiliflora**, Kz.—An evergreen scandent shrub, the branchlets brown and smooth, the young shoots minutely puberulous; leaves ovate-oblong to oblong, bluntish apiculate, on 2 lin. long somewhat callose-toothed petioles, 2-4 in. long, pergamaceous, entire, glabrous, the nervature, etc., as in the preceding species; flowers minute, white, sessile or nearly so, at the base supported by a linear-subulate puberulous bract of the length of the calyx and often as long as the whole flower, in slender spikes, forming slender minutely greyish-velvety panicles in the axils of the leaves and at the end of the branchlets; calyx puberulous, the lobes triangular, acute; petals thick, oblong, rather blunt, nearly a line long, minutely puberulous; stamens shorter than the petals; filaments thick, puberulous, of the length of the anthers.

Hab.—Burma, probably Martaban.

3. **E. floribunda**, Wall.—An evergreen, large, scandent shrub, all parts quite glabrous, the branchlets verrucose; leaves elliptically or oblong-lanceolate, on a thick, in a dried state angular petiole 3-4 lin. long, obtuse or rounded at the base, 3-4 in. long, acuminate, entire, pergamaceous, distinctly pellucid-dotted along the margins beneath, glabrous, the lateral nerves very faint; flowers small, white, on stiff, strong, 4-cornered pedicels, racemose and forming quite glabrous panicles in the axils of the leaves and also at the end of the branchlets, the peduncles and ramifications more or less sharply cornered; bracts stiff, linear, acuminate, shorter than the pedicels; calyx glabrous, the lobes ovate-lanceolate, acute; petals thick, oblong, blunt, glabrous, about a line long; stamens hardly so long as the petals; the filaments thick, glabrous, about as long as the anthers; drupes almost globular or obovoid-globular, the size of a pepper-kernel, succulent, black when ripe, smooth, 1-seeded.

Hab.—Martaban, in the stunted hill forests of Nattoung, at 6,000 to 7,200 ft. elevation.—Fl. March.—s: l.—SS.=Metam.

4. **E. robusta**, Roxb.; Bedd. Sylv. Madr. 137, t. 19, f. 2; Brand. For. Fl. 284.—*Aip-mway-nway*.—A leaf-shedding large

climbing shrub, all softer parts more or less covered with a soft rusty-brown villous or velvety pubescence; bark smooth, obscurely wrinkled, brownish grey; leaves ovate-oblong to obovate, on a 5-6 lin. long puberulous or pubescent petiole, acute or apiculate, entire, 3-5 in. long, membranous, above along the midrib slightly rusty-puberulous, beneath minutely velvety or densely villous-pubescent from a short rusty-coloured tomentum; flowers small, greenish white, on longer or shorter tomentose or velvety pedicels, forming solitary or clustered, simple, velvety or rusty-tomentose racemes in the axils of the leaves and shorter than them; bracts linear-subulate, as long or shorter than the pedicels; calyx rusty-tomentose or velvety, the lobes ovate, acute; petals about a line long, thick, oblong, acute, reflexed, minutely velvety inside; stamens as long as the petals, exserted; the filaments slender and filiform, longer than the anthers; drupes the size of a pepper-kernel, globular, succulent, when fully ripe bluish black, smooth, crowned by the style, 1-seeded.

Var. 1, **Roxburghii**: tomentum very short and velvety, occasionally very obsolete; racemes usually solitary, slender, minutely puberulous, the pedicels usually about a line long, the bracts much shorter; drupes larger, usually longitudinally striate in a dried state.

Var. 2, **villosa** (*Emb. villosa*, Wall.): tomentum dense, rusty-coloured, sometimes almost villous; racemes solitary or often by pairs or rarely 3, clustered, densely rusty-villous, either robust or slender, the pedicels usually only ½ a line long, strong, the bracts as long or a little longer; drupes smaller, also in a dried state smooth and terete, not striate.

Hab.—Var. 2: very common in the upper mixed forests, especially the drier ones, all over Pegu and Martaban down to Tenasserim.—Fl. Aug.-Sept.; Fr. Jan.-Feb.

5. **E. vestita**, Roxb.—A shrub, 4-6 ft. high, much branched, the young shoots covered with a short rusty-coloured pubescence; leaves lanceolate to elliptically lanceolate, on a glabrescent petiole about 2 lin. long, obtuse at the base, 2-3 in. long, entire or serrate towards the bluntish shortly bristly point, chartaceous, while young often puberulous, afterwards glabrous and beneath somewhat glaucous; flowers small, white, on slender 2 lin. long pedicels, forming short, axillary, solitary or sometimes paired, minutely rusty-puberulous racemes in the axils of the leaves; calyx glabrous, the lobes lanceolate, acute, hardly ⅓ lin. long; corolla about a line in diameter; stamens nearly as long as the corolla-lobes; drupes the size of a pepper-kernel, smooth, globular, on very long slender pedicels.

Hab.—Rather rare in the tropical forests along choungs of the Pegu Yomah.—s.

6. **E. parviflora,** Wall.—A scandent shrub (?) the branchlets all slender and densely rusty-tomentose; leaves small, distichous, ovate to ovate-oblong, on a very short rusty-tomentose petiole, blunt or usually retuse, from $\frac{1}{3}$-1 in. long, entire, almost chartaceous, glabrous except the puberulous midrib, the nerves very faint; flowers small, white, on 1-2 lin. long rusty-pubescent pedicels, forming small, short, rusty-pubescent racemes in the axils of the leaves and very much shorter than them; calyx rusty-pubescent, the lobes ovate, acute; petals oblong, about a line long, minutely puberulous outside; stamens as long as the petals, but shorter than the slender filiform filaments, exserted; drupes globular, the size of a very small pea, smooth or indistinctly longitudinally striate, bluish black, crowned by the style, 1-seeded.

Hab.—Burma, probably Ava hills.

7. **E. myrtillus,** Kz.—An evergreen shrub, prostrate (?), the branchlets slender and rusty-pubescent; leaves small, elliptical, on slender petioles a line long, serrately 3-toothed at the apex, $\frac{1}{2}$-$\frac{3}{4}$ in. long, coriaceous, glabrous, beneath covered with conspicuous (in a dried state hollow) glands, the nervature rather strong; flowers small, 4-merous, on drooping, slender, minutely puberulous, about 2 lin. long pedicels, forming a small, umbel-like almost sessile puberulous raceme in the axils of the leaves and much shorter than them; calyx glabrous, the lobes lanceolate, acute; petals linear-oblong, blunt, more than a line long; stamens as long as the petals; filaments slender and much longer than the oblong anthers.

Hab.—Burma; no locality given.

MYRSINE, L.

Flowers usually polygamously dioecious. Calyx 4- or 5-cleft; corolla deeply 4- or 5-lobed, the lobes imbricate or very rarely valvate. Stamens free, inserted at the base of the corolla-lobes; anthers erect, gland-tipped, nearly 2-lobed at the base, much longer than the very short filaments, the cells opening from the base in a longitudinal slit. Ovary globular, superior, 1-celled, with 4 or 5 peltate ovules round the apex of the spherical usually depressed placenta; style short, with a capitate or 3-lobed fringed stigma. Drupes globular, containing a solitary by abortion 1-seeded crustaceous nut.—Small trees or shrubs, with coriaceous leaves. Flowers small, in sessile axillary umbels or clusters. Bracts minute, deciduous.

Leaves serrate-toothed, the nerves prominent beneath; stigma 3-lobed, the lobes large and fringed . . . . . *M. semiserrata.*
Leaves entire, the nerves thin or almost invisible; stigma simply capitate or obscurely 2-lobed . . . . . *M. avenis.*

1. **M. semiserrata,** Wall.; Brand. For. Fl. 285.—An evergreen tree (20—25 + (?) + 1—2), usually stunted, all parts quite glabrous; leaves more or less lanceolate, at the base more or less decurrent on the 3 to 4 lin. long petiole, acuminate, serrate-toothed, usually entire towards the base, 3-4 in. long, chartaceous or thin-coriaceous, not dotted, glabrous, the lateral nerves copious, thin, but like the veins conspicuous; flowers greenish, small, on 1-1½ lin. long glabrous pedicels, forming rather poor sessile umbellets or rather clusters in the axils of the leaves and more especially above the scars of the fallen ones; calyx glabrous, the lobes oblong-lanceolate, acute, valvate; corolla-lobes about 1½ lin. long, revolute, ciliolate at the apex; anthers in the hermaphrodites yellowish, smaller and shorter than the corolla-lobes, without fertile pollen, in the males on longer filaments and larger, blue; stigma large, 3-lobed, the lobes expanded and fringed; drupes the size of a pepper-kernel, red, then bluish black, globular, smooth, crowned by the short style, 1-seeded.

Hab.—Frequent in the drier hill forests of the Martaban hills, as on the Nattoung ridges, at 6,000 to 7,200 ft. elevation.—Fl. Fr. March.—l.—SS.= Metam.

2. **M. avenis,** DC. (*M. capitellata,* Wall.; Bedd. Sylv. Madr., t. 234; Brand. For. Fl. 286).—An evergreen tree (20—25 + (?) + 1—2), usually stunted, all parts glabrous; leaves lanceolate to almost obovate-lanceolate, tapering into a 3-6 lin. long petiole, bluntish or bluntish acuminate, entire, coriaceous or thick-pergamaceous, variable in size, now 4 to 7, now only 1-3 in. long, glabrous, not dotted, the nerves and veins beneath very thin and faint, or almost invisible; flowers small, 5-merous, greenish, dioecious or polygamous, sessile or on short pedicels, forming dense sessile heads or clusters in the axils of the leaves and especially above the scars of the fallen ones; bracts ovate, concave, coriaceous; calyx urceolate, the lobes ovate, acute; corolla-lobes about a line long, lanceolate, recurved, covered with numerous minute brown glands; stigma slightly capitate and lobed; stamens shorter; drupes globular, the size of a pepper-kernel, in a dried state longitudinally striate, crowned by the style, when fully ripe bluish black, 1-seeded.

Hab.—Frequent in the drier hill forests of Martaban, at 4,000 to 7,000 ft. elevation; a variety of it (*M. lucida,* Wall.) not unfrequent in the Eng forests of the Prome district at no elevation; also Ava.—Fl. Apr.-May; Fr. March.—l.—SS.=Metam.; the var. CaS. Lat.

ARDISIA, Sw.

Calyx 5-parted or rarely 5-cleft, the lobes convolute-imbricate. Corolla 5-parted or rarely 5-cleft, the lobes spreading or reflexed, contorted-imbricate or very rarely valvate in bud. Stamens 5, inserted in the corolla-tube or to its base; filaments free, usually very short; anthers free, erect, 2-cleft or emarginate at the base, the cells not chambered, opening in longitudinal slits. Ovary superior, 1-celled, with many peltate ovules on a central spherical placenta; style filiform, with a subulate stigma. Drupe globular, more or less succulent, containing a coriaceous by abortion 1-seeded nut.—Shrubs, sometimes trees or undershrubs, with alternate often dotted leaves. Flowers rather small, but showy, usually waxy, forming mostly short umbel-like racemes axillary or rarely terminal, or in terminal panicles.

* *Flowers in terminal compound panicles or the panicles terminal with smaller ones in the axils of the upper leaves.*

× Pedicels much shorter than the calyx, or the flowers almost sessile; leaves entire.

Panicle stiff and strong, minutely rusty-puberulous; calyx-lobes acute . . . . . *A. rigida.*

× × Pedicels longer than the calyx.

○ Pedicels only 1-2 lin. long.

† Leaves entire.

Leaves coriaceous, decurrent on the strong petiole, the nerves in acute angles; panicles glabrous or nearly so, ample; peduncles angular . . . . . *A. paniculata.*

Leaves almost chartaceous, not decurrent, the nerves almost rectangularly diverging, numerous; panicles slightly puberulous; peduncles compressed . . . . . *A. anceps.*

Leaves chartaceous; panicles rusty-puberulous; calyx-lobes lanceolate . . . . . *A. neriifolia.*

†† Leaves serrulate.

Habit as former; calyx-lobes linear . . . . . *A. serrulata.*

○○ Pedicels ½-1 in. long; panicles terminal, consisting of a few slender umbel-like racemes.

Exactly as *A. attenuata*; leaves much dotted . . . . . *A. Andamanica.*

* * *Flowers racemose, the racemes more or less umbel-like contracted, peduncled or sessile, axillary or spuriously terminal, i. e. arising from the summit of an axillary shoot.*

× Leaves entire.

○ Calyx-lobes broad, rounded or blunt.

† Quite glabrous.

Leaves 3-5 in. long, lanceolate to oblong-lanceolate; corolla lobes nearly 2½ lin. long; pedicels about an inch long . . . } *A. attenuata.* *A. oblonga.*

Leaves 5-10 in. long, obovate-lanceolate; pedicels ½ an in. long . *A. polycephala.*

Leaves 5-7 in. long, oblong-lanceolate; pedicels about an in. long . *A. arborescens.*

Leaves 3-5 in. long, obovate-lanceolate; pedicels about an in. long . *A. humilis.*

†† Young shoots, and often also the inflorescence or under-surface of leaves, puberulous or pilose; calyx-lobes a line long . . . . . *A. Amherstiana.*

○○ Calyx-lobes acute or acuminate, lanceolate or narrow.

Racemes almost terminal, umbel-like, puberulous . . . *A. grandifolia.*
Nearly glabrous; leaves thin-chartaceous; flowers minute, in very small rusty-velvety cyme-like racemes of the length of the petiole . . . . . *A. eugeniæfolia.*
× × Leaves more or less serrate or crenate (at least towards the apex).
○ Inflorescence long-peduncled.
† Calyx-lobes bluntish.
Glabrous or the young shoots and slender-bracted racemes puberulous; leaves acute . . . . . *A. Wallichii.*
Glabrous; leaves blunt; racemes umbel-like, puberulous or glabrous, somewhat shorter than the leaves . . . . . *A. Brandisiana.*
†† Calyx-lobes acute.
Rusty-tomentose or pubescent; leaves acuminate . . . . *A. Helferi.*
○ ○ Inflorescence sessile, or at least the primary racemes sessile and the lateral ones only peduncled.
Inflorescence and leaves glabrous; calyx-lobes a line long . . *A. crispa.*
Leaves beneath and inflorescence brownish; calyx-lobes 2½ lin. long . . . . . *A. villosa.*

* *Flowers in terminal compound panicles or the panicles accompanied by smaller ones in the axils of the upper leaves.*

1. **A. rigida,** Kz.—An evergreen shrub (?), the young shoots probably indistinctly rusty-lepidote; leaves oblong-lanceolate, tapering in a strong petiole, 4-6 lin. long, shortly and bluntish acuminate, pergamaceous, entire, 6-9 in. long, glabrous, dotted, the nerves rather parallel and prominent beneath; flowers small, on ½ to nearly ⅔ lin. long, thick, minutely rusty-puberulous nodding pedicels, racemose-umbellate on the very short strong branchings of the compound, rigid, strong, minutely rusty-puberulous terminal panicle; calyx minutely and indistinctly puberulous, the lobes ovate, rather acute, hardly ½ a line long, ciliolate; unripe drupes globular, glabrous.

Hab.—Tenasserim or Andamans.

2. **A. paniculata,** Roxb.; Bedd. Sylv. Madr. 138.—An evergreen large shrub or small tree, all parts quite glabrous; leaves crowded at the end of the branchlets, obovate-cuneate to lanceolate-cuneate, tapering and decurrent on the short strong petiole, acute or bluntish, ½-1½ ft. long, entire, glabrous, pergamaceous, the lateral nerves strong and rather parallel; flowers small, rose-coloured, on 2-3 lin. long glabrous pedicels, umbellate or nearly so, forming an ample, compound, glabrous panicle at the end of the branches; calyx-lobes ovate, rather acute, glabrous; corolla rotate, the lobes more than 2 lin. long, ovate, acute; drupes globular, rather depressed, red, shining, the size of a large pea.

Hab.—Hilly parts of Chittagong.

3. **A. anceps,** Wall.—An evergreen tree (20—25 + (?) + ½—1), the branchlets all compressed and covered by an indistinct silvery-

lepidote indumentum; leaves elliptically lanceolate to lanceolate, tapering in an ½-1 in. long petiole, longer or shorter acuminate, entire, 5-9 in. long, chartaceous, glabrous, the lateral nerves rather parallel and diverging; flowers pink, rather small, on a line long glabrous or indistinctly rusty-downy pedicels, more or less umbellulate on short peduncles, forming a compound, rather lax, minutely and indistinctly lepidote or rusty-puberulous panicle at the end of the branchlets; calyx indistinctly puberulous or glabrous, the lobes about 1½ lin. long, lanceolate, acute or nearly so, glandular-dotted; corolla rotate, the lobes ovate, acute, dotted; drupes globular, the size of a small pea, smooth, sea-green, when fully ripe white, 1-seeded.

Hab.—Not unfrequent in the tropical forests of Martaban and Tenasserim, up to 3,000 ft. elevation.—Fr. Feb.-May.—s.—SS.=Metam.

4. **A. neriifolia,** Wall.—An evergreen shrub, the very young shoots covered with a rusty-brown, dense, scaly tomentum, the branches greyish brown; leaves lanceolate to oblong-lanceolate, acute at the base, on a rather slender petiole 3-5 lin. long, rather shortly and often rather abruptly but bluntish or almost notchedly acuminate, 2-5 in. long, entire and somewhat waved, membranous and thin, glabrous, beneath sprinkled with rusty-coloured dots and more or less gland-dotted, the nerves parallel and crowded, diverging and very faint; flowers small, rose-coloured, on 1-1½ lin. long pedicels, forming a simple or compound, umbel-like, indistinctly rusty-puberulous raceme on very long slender peduncles in the axils of the upper leaves and collected in a terminal panicle; calyx glabrous or nearly so, the lobes lanceolate, acute, about ½ a line long; corolla rotate, the lobes 1-1½ lin. long, ovate, acuminate.

Hab.—Burma.

5. **A. serrulata,** Kz.—An evergreen shrub, the young shoots covered with a scaly rusty-coloured tomentum; leaves lanceolate or elliptically lanceolate, the base tapering in a 5-8 lin. long petiole, shortly acuminate or acute, repand-serrulate, entire towards the base, 4-6 in. long, thin and membranous, glabrous, sparingly dotted, the nerves crowded, rather parallel, diverging and faint; flowers small, on 1-1½ lin. long, unequal, slender, rusty-puberulous pedicels, in rather dense thyrsoid racemes forming ample, rusty-puberulous, bracted panicles at the end of the branches and in the axils of the upper leaves; bracts leafy, linear-lanceolate, 3-6 lin. long, rusty-lepidote beneath; bractlets smaller, linear; calyx rusty-puberulous, the lobes linear, acute, about a line long; corolla almost rotate, the lobes ovate, acute, about 2 lin. long.

Hab.—Burma.

6. **A. Andamanica,** Kz.—An evergreen small shrub, 2-4 ft.

high, all parts quite glabrous, the branches terete, red-brown; leaves oblong- to elliptically-lanceolate, on a strong petiole 4-6 lin. long, acuminate, 2½-3 in. long, entire, chartaceous, with numerous convex dots on both sides, glabrous, the lateral nerves and veins thin; flowers pale rose-coloured, rather small, on curved, slender, about an inch long glabrous pedicels thickened upwards, by 3-7 in lax, umbel-like, slender, glabrous racemes on about an inch long peduncles, forming a very lax, more or less nodding terminal panicle of the length of the leaves or somewhat longer; calyx glabrous, the lobes about 1½ lin. long rounded, with hyaline ciliolate margins; corolla-lobes ovate-oblong, acute, nearly 2½ lin. long.

HAB.—Not unfrequent in the tropical forests of South Andaman.—Fl. June.—s.—SS.=SiS. Metam.

* * *Flowers in sessile or peduncled more or less umbel-like simple racemes, axillary, or rarely terminal or spuriously terminal*, i. e. *arising from the end of a branchlet in or near the axil of the leaves.*

7. **A. oblonga,** DC.—An evergreen low shrub, 1-3 ft. high, all parts quite glabrous; leaves lanceolate to oblong-lanceolate, on a strong petiole 4-6 lin. long, bluntish acuminate with an obsolete mucro, chartaceous, with numerous convex dots on both sides, entire, glabrous, the lateral nerves lax, curved and thin; flowers pale rose-coloured, rather small, on curved, slender, up to an inch long glabrous pedicels thickened upwards, racemose-umbellate on slender peduncles, simple and axillary; calyx glabrous, the lobes rotundate to broadly ovate, bluntish, or usually 2 of them rounded, minutely lacerate-fringed; corolla rotate, the lobes nearly 2½ lin. long, ovate, acute; drupes globular, the size of a pea, longitudinally striate in a dried state, purplish black, 1-seeded.

HAB.—Not unfrequent in the tropical forests of Martaban and Tenasserim; also in the Andamans.—Fl. June; Fr. Sept.-March.—s.—SS.=Metam.

8. **A. attenuata,** Wall.—"Leaves large, 5-8 in. long by 15-20 lin. broad, oblong-lanceolate, acuminate at both ends, narrowed in a 5-6 lin. long petiole, especially along the margins dotted, membranous; racemes glabrous, axillary, few-flowered, half as long as the leaves; fruiting peduncles 3-4 in. long, naked, the pedicels an inch long; calyx-lobes ½ a line long, rather broad, ovate, nearly acute, almost ciliate; drupes 2 lin. in diameter, globular, glabrous." —(DC. Prod.)

HAB.—Tenasserim.

9. **A. polycephala,** Wall.—An evergreen shrub; leaves obovate-lanceolate, gradually tapering in a 4-5 lin. long petiole, acute or shortly acuminate, almost entire, 5-10 in. long, 1½-3 in. broad, rather

pergamaceous, glabrous, blackish-dotted beneath, the lateral nerves rather prominent; peduncles at the summit of the branches, numerous, many-flowered, half as long as the leaves or shorter, compressed, glabrous; pedicels ½ an in. long, recurved after flowering, copious, alternate, forming an ovoid raceme; calyx-lobes ovate-rotundate, nearly ciliate; corolla-lobes acute, five times longer than the calyx; drupes about 2 lin. long, striate in a dried state.—(DC. Prod., in part.)

Var. (?) 2, **acuminata**: leaves acuminate the nerves strong and anastomosing within the margins of the leaves.

Hab.—Upper Tenasserim; var. 2: common in the tropical forests along the eastern slopes of the Pegu Yomah and Martaban.—Fl. May.—s.

10. **A. arborescens,** Wall.—"Glabrous, the branches stout, the older ones scared and tubercled; leaves oblong-lanceolate, on ½ an in. long petiole, 5-7 in. long by 1½-2 broad, tapering at the base, acute, coriaceous, the nerves and dots little visible; flowers unknown, the peduncles 3-4 in. long, often compressed, smooth, axillary, rigid, shorter than the leaf, the pedicels much longer than the flowers, about an inch long; calyx-lobes ovate, larger after flowering and 2 lin. long; drupes globular, 3 lin. thick."—(DC. Prod.)

Hab.—Ava, Taong-dong.

11. **A. humilis,** Vhl.; Brand. For. Fl. 287.—*Gyeng-ma-ope.*—An evergreen tree (12—25+6—12+½—1½) or shrub, all parts quite glabrous; leaves obovate-oblong or oblong, tapering in a strong 3-4 lin. long petiole, acute or very shortly acuminate, entire, 4-6 in. long, pergamaceous, glabrous, the nerves and veination thin but conspicuous; flowers rather large and conspicuous, rose-coloured or greenish rose, on nearly an inch long, strong, terete, glabrous pedicels thickened upwards, forming a glabrous, umbel-like raceme on a 1-3 in. long, more or less compressed, nude peduncle in the axils of the leaves; bractlets small, concave, deciduous; calyx conspicuous, glabrous, the lobes about 2 lin. long, broad, rounded or blunt, the margins membranous and pellucid; corolla thick, waxy glossy, the lobes ovate-oblong, acute, about 4 lin. long; ovules numerous, immersed in the globose spongy placenta; drupes globular, the size of a very small cherry, smooth and glossy, when fully ripe succulent and black, 1-seeded.

Hab.—Frequent in the tropical forests of the Pegu Yomah and Arracan.—Fl. March-Apr.; Fr. Oct.—s.—SS.=SiS.

12. **A. littoralis,** Andr.—An evergreen shrub, 6-10 ft. high, often growing out into a small tree, all softer parts quite glabrous and more or less succulent; leaves obovate to oblong, tapering in a 4-6

lin. long strong petiole, 3-5 in. long, blunt or apiculate, entire, succulent-coriaceous, glossy, glabrous, the nerves in a dried state thin but conspicuous; flowers rather small, rose-coloured, on strong terete 6-9 lin. long curved pedicels, forming an umbel-like glabrous, rather robust raceme on about an inch long peduncle in the axils of the leaves; calyx glabrous, the lobes rotundate-ovate, more than a line long; corolla-lobes recurved, lanceolate, acuminate, waxy-glossy, about 4 lin. long; drupes depressed-globular, the size of a large pea, when fully ripe purplish black and succulent, shining and smooth, 1-seeded.

Hab.—In the beach jungles and along the sea-shores of the Andamans and Tenasserim.—Fl. May-June.—l.—SS. = Aren. Sal.

13. **A. Amherstiana,** DC.—An evergreen shrub, the young shoots covered with a rusty-coloured pilose or short velvety tomentum; leaves oblong to elongate-oblong, obtuse and usually unequal at the base, on a strong, puberulous petiole 2-3 lin. long, 5-10 in. long, shortly and usually bluntish acuminate, entire, pergamaceous, while young thinly puberulous beneath, dotted, the nerves numerous, thin, parallel and curved with copious net-veination between them; flowers rather small, on thick, recurved, tawny-velvety, 8-10 lin. long pedicels, forming a rather dense, umbel-like, tawny-velvety raceme on a 1-2 in. long peduncle in the axils of the leaves and often crowded by 2 or 3 at the end of the branchlets; calyx minutely puberulous, coriaceous, the lobes oval and rounded, about a line long; corolla rotate, glabrous, the lobes ovate, acuminate, nearly 3-2½ lin. long; drupes globular, the size of a small pea, longitudinally striate, glabrous, 1-seeded.

Hab.—Southern Pegu and Upper Tenasserim.—Fl. March; Fr. Feb.-March.

14. **A. grandifolia,** DC.—Branches pilose; leaves obovate-oblong, large, narrowed in a 4-8 lin. long very hispid petiole at the acute base, cuspidate-acute, 5-9 in. long by 3-4 broad, not coriaceous, glabrous above, beneath pilose and very hispid from silky purplish hairs along the midrib; racemes almost terminal, one-fifth the length of the leaves, puberulous, the pedicels nearly umbellate, hardly shorter than the peduncle; calyx-lobes lanceolate, acute, nearly ciliate, 2 lin. long; drupes glabrous, 3 lin. thick.—(DC. Prod.)

Hab.—Tenasserim.

15. **A. eugeniæfolia,** Wall.—An evergreen shrub, the branchlets covered with a minute rusty-coloured down; leaves oblong to oblong-lanceolate, acute at the base, on a strong, 4-5 lin. long, minutely rusty-puberulous petiole, rather abruptly acuminate, entire

or waved, 6-9 in. long, chartaceous, glabrous, dotted beneath, the nerves and net-veination strong and conspicuous; flowers small, on minutely rusty-tomentose, about a lin. long, nodding pedicels, in small umbelets and forming a small cyme-like rusty-velvety panicle in the axils of the leaves of about the length of the petiole or longer; calyx rusty-puberulous, the lobes ovate, acute and blunt in the same inflorescence; corolla glabrous, bell-shaped, about 1½ lin. long, the lobes ovate, acute.

Hab.—Martaban hills, at 4,000 ft. elevation.—Fl. Feb.

16. **A. Wallichii,** DC.—*Kyet-ma-ouk-pin.*—An evergreen undershrub, ½ to 1½ in. high, the young shoots more or less rusty-floccose, or almost glabrous; leaves obovate, usually cuneate at the base and decurrent on the 3-5 lin. long often puberulous petiole, 2½-4 in. long, bluntish or acute, crenate-toothed from about the middle, almost pergamaceous, glabrous, copiously dotted, the nerves and net-veination thin but conspicuous; flowers rose-coloured, rather small but showy, on 8 lin. to nearly an inch long, somewhat nodding, slender, glabrous or rusty-pilose pedicels, forming a few-flowered, somewhat nodding, umbel-like, glabrous or rusty-pilose raceme on a 1-1⅓ in. long, slender, axillary peduncle; bractlets oblong-lanceolate, acuminate, nearly 3 lin. long, deciduous; calyx minutely puberulous or rusty-pilose, the lobes ovate, acute or rather bluntish, about a line long; corolla rotate, the lobes about 3 lin. long, ovate, acuminate; drupes globular, the size of a small pea, longitudinally striate in a dried state, succulent and purplish black when fully ripe, shining, 1-seeded.

Var. 1, **Wallichii proper:** the young shoots and inflorescence covered with a rusty-brown floccose-pilose pubescence, the net-veination and dots more conspicuous and more prominent.

Var. 2, **glabriuscula:** the young shoots glabrous, the inflorescence and pedicels indistinctly puberulous, the net-veination very faint.

Hab.—Frequent all over Pegu and Martaban down to Tenasserim; var. 2: especially in the mixed forests; var. 1: in the low and Eng forests.—Fl. Sept.-Jan. (Apr.-May); Fr. about the same period.—l.—SS.=SiS. All. Metam. Dil.

17. **A. Brandisiana,** Kz.—An evergreen shrub, the branches rather thick and succulent, indistinctly lepidote; leaves oblong or elliptically oblong, on a ⅔-1 in. long strong petiole, unequal at the acute base, 5-6 in. long, blunt, undulate-repand, pergamaceous, glabrous, the lateral nerves thin and parallel-curved, the lax net-veination and the minute dots little visible; flowers conspicuous, but not large, on an inch long, minutely puberulous, especially upwards very thickened pedicels, forming a terminal, umbel-like, minutely puberulous raceme on a 3-4 in. long nude peduncle arising

rom the axils of the leaves and shorter than them; calyx almost glabrous, the lobes about 2 lin. long, ovate-oblong, acute, membranous; corolla slightly rotate, the lobes more than twice the length f the calyx-lobes, ovate, acuminate.

HAB.—Martaban.—Fl. May.

18. **A. Helferiana,** Kz.—An evergreen shrub, all parts more or ess covered by a rusty-coloured almost tomentose pubescence; eaves obovate-oblong to oblong, on a strong, densely rusty-pubesent petiole 3-4 lin. long, shortly acuminate, entire or obsoletely epand-toothed, 3-5 in. long, membranous, on both sides (above hinly) rusty-pubescent, the lateral nerves thin and curved; flowers ather small, on ½ to nearly an inch long rusty-pilose pedicels, orming a short, umbel-like, rusty-pubescent raceme towards the pex of the 3-4 in. long, slender, nude, axillary peduncle; calyx rustyilose, the lobes about a line long, oblong-lanceolate, acute; corolla glabrous, the lobes about 2½ lin. long, oblong, acute.

HAB.—Tenasserim.

19. **A. crispa,** DC.—An evergreen small shrub, all parts quite glabrous; leaves lanceolate to oblong-lanceolate, on a short 1-2 lin. ong petiole and more or less decurrent, rather bluntish acuminate, -4 in. long, membranous, undulate-crenate, glabrous, not dotted r so along the margins, the nerves thin without net-veination; lowers small, rose-coloured to white, or sprinkled with rose-coloured ots, on 6-8 lin. long, slender, glabrous pedicels, forming a short, mbel-like, glabrous, sessile or almost sessile, recurved raceme at the nd of the branchlets, rarely the one or other umbel growing out into peduncled and very slender raceme; calyx glabrous, the lobes hardly line long, ovate, bluntish; corolla rotate, the lobes ovate-oblong, cute, about 2-2½ lin. long; drupes globular, the size of a small ea, red and shining, succulent, crowned by the long slender style, ongitudinally striate in a dried state.

HAB.—Not unfrequent in the damp hill forests of Martaban, at 4,000 to ,000 ft. elevation.—Fl. March.—Fr. March.—s.—SS.=Metam.

20. **A. villosa,** Roxb.—An evergreen small shrub, all softer arts covered by a rusty-coloured tomentum; leaves lanceolate, on strong 2-3 lin. long densely rusty-tomentose petiole, acuminate, nore or less distinctly crenate, 4-6 in. long, membranous, on both ides more or less distinctly dotted, glabrous above, beneath thinly usty-pubescent (at least along the nerves), rarely glabrescent, the erves and veins thin; flowers rather small, on 4-6 lin. long rustyomentose pedicels, forming a rusty-tomentose, sessile or almost essile, umbel-like raceme at the end of the branchlets or at the end f the axillary at the apex 2-leaved branchlets and appearing spuri-

ously axillary; calyx white, rusty-pilose, the lobes linear-oblong, bluntish or acute, nearly 3 lin. long; corolla rotate, glabrous, the lobes about ⅓ longer than the calyx, ovate, acuminate; berries globular, the size of a pea, sparingly puberulous, glossy, scarlet, turning dark purple, succulent, 1-seeded.

Var. 1, **Roxburghiana**: leaves beneath more or less rusty-pubescent (at least along the nerves).

Var. 2, **glabrata** (*A. glabrata*, Bl.): leaves, at least when full-grown, glabrous; calyx glabrous or nearly so.

Hab.—Var. 1: in the tropical and moist hill forests of Martaban and Tenasserim, up to 4,000 ft. elevation.—Fl. Sept.-Oct.; Fr. Oct. to Feb.—s.—SS.= Metam.

AEGICERAS, Gaertn.

Calyx 5-parted, convolute in bud. Corolla 5-cleft, contorted in bud, the tube cylindrical and as long as the calyx. Stamens 5, inserted in the tube, opposite the lobes, exserted; filaments subulate, at the base united in a short tube; anthers 2-celled, acuminate, the cells opening in a longitudinal slit and many-chambered within. Ovary free, spindle-shaped, 1-celled, with many ovules attached to the sides of a central, ovoid-conical, shortly stalked placenta; style filiform, with an acute stigma. Fruit a dry follicle-shaped curved capsule, with ripening irregularly bursting by 1 or 2 longitudinal slits. Seed solitary, conform to the capsule and germinating within the pericarp while still on the tree. Albumen none. Cotyledons thick and fleshy.—Small trees or shrubs of the habit of mangroves, with shining coriaceous leaves. Flowers rather small, in umbels or very short umbel-like racemes, axillary or terminal.

1. **A. corniculata**, Blanco. (*Aeg. majus*, Gaertn.; Bedd. Sylv. Madr. 139).—*Boo-ta-yet.*—An evergreen tree (12—15+3—5+½—1), or remaining low and shrubby, all parts quite glabrous; leaves alternate to almost whorled, obovate to cuneate-obovate, tapering in a strong petiole 4-6 lin. long, 1½-4 in. long, rounded or often almost retuse at the apex, entire, firmly coriaceous, glabrous, shining, the nerves in a dried state thin but conspicuous; flowers rather small, pure white and fragrant, on slender but strong up to an inch long pedicels, numerous and forming a short-peduncled or almost sessile, glabrous, somewhat nodding umbel or umbel-like raceme at the end of the branchlets and often also in the axils of the leaves; calyx glabrous, about 2 lin. long, the lobes oblong, blunt, much twisted; corolla-lobes rather more than 2 lin. long, oblong-lanceolate, acuminate; fruits terete, follicle-shaped, curved, subulate-pointed, up to 1½ in. long, smooth.

HAB.—Frequent in the littoral, especially the mangrove, forests all along the shores from Chittagong down to Tenasserim and the Andamans.—Fl. Feb.-March.—SS.=Sal.

SAPOTACEAE.

Flowers regular, hermaphrodite. Calyx 5- rarely 4-8-parted or lobed, the lobes either in 2 or rarely 3 series, and the outer series valvate in bud, or when only 4, decussate-imbricate, or when 5, 2 or rarely 3 of them exterior and imbricate. Corolla more or less divided into as many or rarely twice as many lobes as calyx-segments, imbricate in bud. Perfect stamens as many or twice as many as calyx-lobes; anthers 2-celled, dehiscing in various ways by longitudinal slits. Staminodes or the small petal-like scales alternating with the corolla-lobes or the perfect stamens, rarely wanting. Ovary free, superior, 2- or more-celled, the cells with a solitary ovule, erect, suspended or laterally attached; style simple, with an entire or very slightly lobed stigma. Fruit a drupe or berry, usually indehiscent, by abortion often few-celled. Seeds ellipsoid or globular, usually laterally compressed, with an inferior or lateral hilum, the testa bony or crustaceous, glossy. Albumen fleshy or oily, or none, in the former case the cotyledons flat and leafy, in the last thick and fleshy, the radicle inferior.—Trees or shrubs, usually abounding in milky juice, with alternate, very rarely almost whorled, simple leaves. Stipules none. Flowers axillary, solitary or clustered, rarely in panicles. Bracts small or none.

All the fourteen Burmese species are trees, some of which yield very valuable hard timber, like bullet-wood. The bark of some species of *Achras* is astringent and febrifugal. The milky juice of several species of *Isonandra* (especially *I. Gutta*) thickens into gutta-percha. The flowers of *Bassia latifolia* are largely eaten by the poor in India. Other, chiefly American, trees of this order furnish good dessert-fruits, like the sappodilla plum (*Achras Sapota*), the star-apple (*Chrysophyllum cainito*), the marmalade (*Achras mammosa*), and others.

* *Calyx-lobes equal in number with the corolla-lobes.*

○ Staminodes as many as stamens and alternating with them.

Flowers 5-merous; ovary-cells 5-2; stamens 5 . . . . *Sideroxylon.*

Flowers 6-merous; stamens 6; ovary-cells 12 . . . . *Achras.*

○ ○ No staminodes.

Flowers 5-8-merous, with as many stamens and ovary-cells . *Chrysophyllum.*

Flowers 4- or 6-merous; stamens twice as many as lobes, in a single series; ovary-cells as many as calyx-lobes . . *Isonandra.*

* * *Calyx-lobes and corolla-lobes unequal in number, usually the latter* 2-3 *times as many.*

○ Ovary-cells twice as many as calyx-lobes; staminodes none.

Calyx-lobes 4 or 6; corolla-lobes and ovary-cells twice as many; stamens twice as many as corolla-lobes, in two series . . *Payena.*
○ ○ Ovary-cells as many as calyx-lobes
Calyx-lobes and ovary-cells 4 or 6; corolla-lobes 8-14; stamens about 2 or 3 times as many as corolla-lobes, in 1-3 series; staminodes none . . . . . *Bassia.*
Calyx-lobes and ovary-cells 6 or 8 each; corolla-lobes 2 or 3 times as many; staminodes 6 or 8 . . . . . *Mimusops.*

SIDEROXYLON, L.

Calyx 5-parted, the lobes imbricate in bud. Corolla 5-cleft or almost 5-parted, the lobes usually spreading, imbricate. Fertile stamens 5, inserted in the corolla-tube opposite the lobes; anthers ovate, blunt, directed outwards, versatile. Staminodes 5, petaloid, included and alternating with the stamens. Ovary usually 5-, rarely 4- or 2-celled, the style often longer than the ovary, with an entire or almost entire stigma. Berry ovoid or globose, by abortion usually 3-1-celled with as many slightly compressed glossy seeds. Albumen copious. Cotyledons large, leafy, flat.—Trees with milky juice, sometimes armed, the leaves glabrous or tomentose. Flowers usually small or minute, in axillary clusters.

* *Calyx-lobes acuminate or acute. Young shoots and under-surface of leaves more or less villous-tomentose.*
Armed with long solitary supra-axillary spines; calyx-lobes acute. *S. armatum.*
Unarmed or nearly so; calyx-lobes acuminate . . . . *S. tomentosum.*
** *Calyx-lobes rounded or blunt.*
Glabrous; leaves chartaceous . . . . . *S. grandifolium.*
Young parts coppery or rusty silk-hairy; leaves coriaceous . . *S. attenuatum.*

1. **S. tomentosum,** Roxb. (*Achras tomentosa*, Roxb.; Bedd. Sylv. Madr. 142).—*Thit-cho.*—An evergreen, middling-sized tree, unarmed, the younger parts covered with a villous tomentum and sometimes furnished with short, sharp, axillary spines; leaves oblong to almost obovate-oblong, on a short but slender, usually somewhat villous petiole, blunt or nearly so, slightly waved, 3-4 in. long, chartaceous, glabrous above, beneath more or less tawny-villous and often glabrescent, penninerved, the nerves slightly curved; flowers rather small, dull-white, 5-merous, on 2-3 lin. long, nodding, villous pedicels clustered in the axils of the leaves; calyx villous, the lobes as long as the pedicel, ovate-lanceolate, acuminate; corolla-tube pubescent within, the lobes lanceolate; anthers cordate-ovate, acute; petaloid staminodes as long as the stamens, lanceolate-acuminate, waved, yellow; berries ovate, the size of an olive, yellow, usually by abortion 1- or 2-seeded.

Hab.—Not unfrequent in the dry and Eng forests of the Prome district, rare in those of Pegu, Irrawaddi zone.—l.—SS.=CaS., Lat.

Remarks.—Wood brown, loose-grained, fibrous, rather heavy.

2. **S. grandifolium,** Wall.—*Taw-tha-pwot-pen.*—An evergreen large tree, all parts glabrous; leaves crowded at the extremities of the thick branchlets, obovate-oblong to obovate-lanceolate, tapering at the cuneate base in a ½-1 in. long petiole, 5-10 in. long, bluntish apiculate, entire, chartaceous, quite glabrous, the nerves conspicuous and sharply prominent, the net-veination lax; flowers small, greenish, 5-merous, on about a line long minutely pubescent pedicels, in dense axillary clusters or more usually crowded on the numerous, short, wart-like tubercles arising from above the scars of the fallen leaves; calyx appressed-pubescent with the outer lobes more or less glabrescent, the lobes about a line long, rotundate, with membranous whitish borders; corolla whitish, nearly globular, scarcely longer than the calyx, the lobes ovate, blunt, crenulate; anthers ovate; staminodes linear, whitish; ovary flattish-ovate, densely bearded from erect rather stiff hairs; berries globular, the size of an apple, umbonate, smooth, yellow, then brown.

Hab.—Martaban, in the hill ranges between the Beeling and Sittang.—Fl. Apr.

3. **S. attenuatum,** DC.—An evergreen small tree, the robust branchlets appressed rusty or almost coppery silk-hairy; leaves obovate-oblong to obovate, at the cuneate base tapering in a ½-1 in. long petiole, blunt to bluntish and acute, 3-5 in. long, entire, coriaceous, with the margins usually recurved, glossy, while young covered beneath with a silky rusty- or copper-coloured pubescence, usually glabrescent, the lateral nerves prominent; flowers small, whitish, 5-merous, on nodding 1-1½ lin. long, appressed, coppery-silky pedicels, clustered in the axils of the leaves; calyx glabrous or coppery silk-hairy, the lobes about a line long, rotundate, with whitish borders; corolla rotate, the lobes rotundate; staminodes scale-like, ovate, acute, lobed; ovary hirsute, surrounded by a glandular, yellowish, crenate-repand disk; berries small, the size of a bean, obliquely oblong, smooth, usually 1-seeded.

Hab.—Tenasserim.—Fl. March.

ACHRAS, L.

Calyx 6-parted, imbricate. Corolla tubular-bell-shaped, 6-lobed; fertile stamens 6, inserted at the lower part of the corolla-tube opposite the lobes; filaments complanate-subulate; anthers directed outwards, erect, sagittately lanceolate, 2-celled, the cells dehiscing in longitudinal slits. Staminodes as many as corolla-lobes and alternating with them, inserted in the corolla-throat, lanceolate or linear-lanceolate. Ovary 12-celled, the ovules solitary, ascending or laterally attached; style simple with an entire bluntish stigma. Berry by abortion 1- or few-celled with as many laterally com-

pressed glossy seeds. Albumen fleshy. Embryo straight, central, with an inferior radicle, the cotyledons almost leafy, ovate, flat.—Trees, with milky juice and entire coriaceous leaves. Flowers sessile or pedicelled, clustered in the axils of the leaves.

1. **A. sapota,** L.; Brand. For. Fl. 288.—*Twot-ta-pat.*—An evergreen tree (40—60 + 15—30 + 3—4), the very young shoots tawny-puberulous; leaves crowded at the end of the thick branchlets, elliptical to elliptically lanceolate, on a ½-1 in. long petiole, bluntish acuminate and almost retuse, entire, coriaceous, 2-3 in. long, glabrous; the lateral nerves very obsolete and impressed; flowers 6-merous, whitish, on ½-1 in. long tawny-puberulous pedicels, solitary in the axils of the leaves; calyx shortly and densely tawny-tomentose, about 3-4 lin. long, the lobes ovate, rather acute; corolla tubular-bell-shaped, somewhat longer than the calyx; stamens 6; berries oblong to ovoid, the size of an egg, when fully ripe scurfy-rough, edible, 10-12-seeded.

Hab.—Of American origin, now frequently seen cultivated in Rangoon and other stations.—Fl. R.S.

Remarks.—Wood uniformly brown, close-grained, rather light, hard. Valued in South America for the shingles of corn-houses. Bark said to be a good substitute for chinine.

CHRYSOPHYLLUM, L.

Calyx 5, rarely 6-8-parted, the lobes imbricate, 2 of them exterior. Corolla tubular, or rotate-bell-shaped, 5- rarely 6-8-lobed, imbricate in bud. Stamens as many as corolla-lobes and opposite to them, inserted in the tube; anthers ovoid or lanceolate, nearly as long as the slender filament, usually laterally dehiscing. Staminodes or scales none. Ovary with as many cells as lobes to the calyx and with a solitary ascending ovule in each; style with a bluntish stigma. Berry by abortion 1- or few-celled, with as many bony seeds. Albumen scanty or none. Embryo axile, large, erect, with a short radicle, the cotyledons thick, ovate, flat.—Trees, with the leaves often rusty- or silvery-tomentose beneath. Flowers small, clustered.

1. **Ch. Roxburghii,** G. Don.; Bedd. Sylv. Madr., t. 236.—*Thankya-pen.*—An evergreen tree (60—70+40—50+4—7), the very young shoots rusty- or tawny-pubescent; leaves elliptically to ovate-lanceolate, on a glabrous or puberulous petiole 1-2 lin. long, 3-4 in. long, produced in a longer or shorter blunt point, entire, chartaceous, glabrous, or while very young puberulous, with a peculiar metallic lustre, parallel-veined, the veins thin and numerous; flowers minute, 5-merous, yellowish, on 1½ to 2½ lin. long tawny-pubescent glabrescent pedicels, clustered in the axils of the

leaves; calyx covered with a fugaceous rusty-coloured pubescence, the lobes oval, blunt, about ½ a line long; corolla-tube as long as the calyx, the lobes blunt; stamens 5, inserted at the lower part of the corolla-tube; anthers ovate; ovary 5-celled and 5-lobed, shortly hairy, the stigma 5-lobed; berries spherical, the size of a small crab-apple, obscurely (in a dried state deeply) 5-lobed, while young appressed rusty-pubescent, but soon turning glabrous, smooth, yellow, edible.

HAB.—Rather rare in the tropical forests of Pegu above Rangoon.—Fl. June; Fr. Dec.—s.—SS.=Lat. p.

ISONANDRA, Wight.

Calyx 4- or 6-parted, the lobes decussately imbricate, or if 6, the outer series almost valvate in bud. Corolla deeply 4- or 6-cleft, the lobes longer than the tube. Stamens twice as many as lobes, in a single series; filaments sometimes elongate; anthers directed outwards, sometimes alternately smaller, dehiscing longitudinally. Staminodes none. Ovary 4- or 6-celled, the cells with a solitary ovule ascending from the inner angle; style long-exserted, rather acute. Berry by abortion usually 1- or 2-celled, with as many erect glossy seeds. Albumen copious. Cotyledons leafy, elliptical, much longer than the radicle.—Trees, abounding in milky juice, with entire leaves. Flowers small or middling-sized, pedicelled, usually in poor axillary clusters.

* *Calyx 4-parted, the lobes decussately imbricate; leaves chartaceous, strongly nerved . . . . . I. caloneura.*

** *Calyx 6-parted, the 3 outer lobes valvate in bud.*

Leaves coriaceous, with obsolete nerves, indistinctly silvery-white-velvety; filaments as long as the anthers, densely villous . *I. polyantha.*

Leaves coriaceous, with strong parallel nerves, glaucous beneath; filaments long and slender, glabrous . . . . . *I. obovata.*

1. **I. caloneura,** Kz.—An evergreen tree (50—60 + 30—40 + 3—5), the young shoots densely appressed rusty-pubescent; leaves elliptical to elliptically oblong, on a coppery-puberulous glabrescent petiole 4-5 lin. long, shortly acuminate, entire, the borders recurved, 4-7 in. long, chartaceous, glossy above, beneath rusty or coppery silk-hairy and glabrescent, the lateral nerves slightly curved and strong, with thinner transverse veins between; fruits ellipsoid-ovate, the size of a plum, on a 1-1½ in. long, nodding, almost glabrous axillary peduncle, apiculate, densely and shortly rusty-puberulous, 1- or 2-seeded; calyx-lobes 6, ovate; seeds half-oblong, nearly 1½ in. long, glossy brown.

HAB.—Frequent in the tropical forests of South Andaman.—Fr. May.—s.—SS.=Metam.

2. **I. polyantha,** Kz.—An evergreen tree, 30-40 ft. high, the young thick branchlets indistinctly silvery- or pale-velvety; leaves

obovate-oblong to obovate-lanceolate and broadly elliptically lanceolate, narrowed towards the cuneate base, on a $\frac{1}{2}$-1 in. long silvery or tawny petiole, 5-10 in. long, shortly and bluntish acuminate or apiculate, entire, coriaceous, glabrous and glossy above, beneath silvery-white from an indistinct minute velvet, the lateral nerves and net-veination thin; flowers middling-sized, 6-merous, on 1-1$\frac{1}{4}$ in. long tawny-tomentose pedicels, clustered in the axils of the leaves; calyx 6-parted, tawny velvety-tomentose, the lobes about 3 lin. long, ovate-oblong, acute, the 3 outer ones valvate; corolla very little longer than the calyx, almost to the base 6-cleft, the lobes narrowly obovate-oblong, blunt, 3 lin. long; anthers cordate-ovate, terminating in 2 short mucros, the filaments as long, densely tawny-villous; ovary densely tawny-pubescent.

Hab.—Rather rare in the tropical forests of Koladyne district, Arracan.—s.—SS.=SiS.

Remarks.—Yields a good quality of gutta-percha in large quantity.

3. **I. obovata,** Griff. — An evergreen tree, the young thick branchlets rusty or tawny-tomentose; leaves crowded towards the end of the branchlets, cuneate-obovate to obovate-oblong and elliptically obovate, tapering in a $\frac{1}{2}$-$\frac{2}{3}$ in. long rusty-tomentose glabrescent petiole, 5-8 in. long, shortly apiculate or bluntish, entire and the borders more or less recurved, coriaceous, glabrous, beneath glaucous-green, the lateral nerves conspicuous, the net-veination lax; flowers middling-sized, 6-merous, on 4-6 lin. long rusty-tomentose pedicels, several together clustered in the axils of the leaves and also arising from tubercles above the scars of the fallen leaves; calyx 6-parted, rusty-tomentose, the lobes about 2 lin. long, ovate, acute; corolla deeply 6-cleft, glabrous, the lobes much longer than the tube, lanceolate, blunt, about 4 lin. long; stamens long-exserted; filaments glabrous, filiform; anthers minutely rusty-villous, mucronate; berries oblong, the size of a plum, glabrous, mucronate, 1- or 2-seeded; seeds oblong or half-oblong, glossy brown.

Hab.—Tropical forests of Tenasserim.—Fr. March.

Remarks.—Yields a fair sort of gutta-percha.

PAYENA, A. DC.

Calyx 4- or 6-parted, the lobes imbricate, the 2 or 3 outer ones broader. Corolla bell-shaped with a short tube, 8- or 12-cleft, the lobes by pairs opposite the sepals. Stamens twice as many as corolla-lobes, inserted in 2 rows at the throat or in the tube of the corolla; filaments very short, glabrous or villous; anthers lanceolate, the connective produced in a truncate beak or bristle, the cells directed outwards. Staminodes none. Ovary 8- or 12-celled, with

a solitary ascending ovule in each cell ; style long-exserted with an obsoletely toothed apex. Berry usually 1- or 2-seeded, the seeds large, somewhat compressed, albuminous. Cotyledons oblong.

* *Calyx* 6-*parted*; *corolla* 12-*lobed.*

Filaments very short, villous ; anthers glabrous, mucronate-acuminate . . . . . *P. Griffithii.*

* * *Calyx* 4-*parted*; *corolla* 8-*lobed*; *anthers glabrous.*

Connective produced in a broad blunt beak ; sepals blunt or nearly so ; nerves somewhat irregular ; petioles about ¼-½ in. long . . . . . *P. lucida.*

Connective terminating into a bristle ; sepals acute ; nerves thin, parallel ; petioles about an inch long, slender . . . *P. paralleloneura.*

1. **P. lucida,** DC.—An evergreen tree, the young branchlets minutely tawny or rusty-puberulous ; leaves from elliptically oblong to oblong and oblong-lanceolate, on a minutely puberulous glabrescent petiole ¼ to ½ in. long, 3-6 in. long, shortly and more or less abruptly acuminate or apiculate, thick-chartaceous, glabrous, silky-glossy, the lateral nerves on the under-surface thin, but prominent and distinct ; flowers middling-sized, white, on ½-1 in. long rusty-puberulous pedicels forming poor clusters in the axils of the leaves of about the length of the petiole or somewhat longer ; calyx minutely rusty-puberulous, 4-parted, the sepals decussate, broad and blunt ; corolla deeply 8-cleft, quite glabrous, the lobes oblong and blunt ; stamens 16, in 2 rows ; anthers glabrous, the connective produced in a thick, flat, blunt beak ; ovary 8-celled, tawny-pubescent.

Hab.—Burma (?) ; probably Tenasserim (?).

2. **P. paralleloneura,** Kz.—An evergreen tree (70—80+40—50+5—7), the young branchlets minutely rusty-puberous ; bark grey ; leaves elliptical or elliptically lanceolate, on a slender, minutely puberulous glabrescent petiole about an inch long, shortly acuminate, 3-4 in. long, thin-coriaceous, glabrous, the lateral nerves thin and very regularly parallel ; flowers middling-sized, white, on about an inch long minutely tawny-puberous pedicels, by 3 to 7, forming lax clusters of about the length of the petiole in the axils of the leaves ; calyx minutely tawny-puberulous, 4-parted, the sepals broadly ovate, acute, about 3 lin. long ; corolla quite glabrous, the lobes elliptically oblong, blunt ; stamens 16, the anthers glabrous, bristly mucronate ; ovary tawny-pubescent ; berries ovoid, the size of a plum, apiculate, glabrous, 1- or rarely 2-seeded.

Hab.—Frequent in the tropical forests of Martaban and Tenasserim.—Fl. March ; Fr. Apr.-May.—s : l.—SS.=Metam.

BASSIA, Koen.

Calyx 4- or 5-parted, the lobes imbricate in 2 rows. Corolla

urceolate-bell-shaped, the lobes varying in number from 6 to 14. Stamens all fertile, about 2 or 3 times as many as corolla-lobes, in a single or in 2 or 3 rows ; filaments usually very short, or those in a single row or of the upper row of the 3-seriate ones elongate ; anthers hastate-lanceolate, blunt or terminating into a short bristle, opening laterally in longitudinal slits. Staminodes or scales none. Ovary 4-8-celled, the cells with a solitary ovule suspended from the summit of the inner angle. Berry 5- or fewer-seeded ; albumen none. Embryo erect, the cotyledons elliptically oblong, oily-fleshy, thick, plano-convex, the radicle short.—Trees, abounding in milky juice, with alternate entire leaves. Flowers usually middling-sized, pedicelled, in axillary clusters.

1. **B. villosa,** Wall.—An evergreen tree, the thick branchlets tawny-tomentose ; leaves obovate-oblong to broadly obovate and oblong, on a puberulous glabrescent petiole 1-½ in. long, unequal and obtuse at the base, 6-8 in. long, blunt or somewhat notched, entire, chartaceous, glabrous above, shortly pubescent beneath, the nerves parallel and strong, the transverse veination conspicuous ; flowers resembling those of *B. butyracea,* middling-sized, on 1-1¼ in. long densely tawny or yellowish velvety-tomentose pedicels, forming axillary clusters ; calyx tawny or yellowish tomentose, 4-parted, the sepals ovate, acuminate, about 4 lin. long ; corolla tubular-bell-shaped, 8-13-cleft, the lobes as long as the tube, elliptically oblong, minutely toothed at the apex ; anthers sparingly pilose, almost sessile or on very short thick filaments, in 2 rows, almost not exserted, aristate ; ovary tawny-villous.

Hab.—Ava, Taong-dong.—Fl. Nov.

MIMUSOPS, L.

Calyx 6- or 8-parted, the lobes in 2 series, the outer one valvate in bud. Corolla with a very short tube, the lobes 2 or 3 times the number of the calyx-lobes and usually linear-lanceolate, in two series, the inner one consisting usually of 6 or 8 erect shorter petals adnate to the filaments. Stamens as many as calyx-lobes, in a single row, inserted at the throat of the corolla and alternating with as many usually toothed or sometimes 2-lobed or 2-cleft scale-like staminodes ; filaments short ; anthers sagittate-lanceolate, directed outwards, acuminate or blunt, opening in longitudinal slits. Ovary with as many cells as there are sepals, the ovules solitary, attached near the base or almost erect ; style shorter than the corolla. Berries 1-2- or rarely 5-6-seeded, the seeds more or less compressed, with the hilum either very small and basal, or more or less elongated and lateral. Albumen copious. Cotyledons broad and flat.—Trees,

abounding in milky juice, with entire coriaceous leaves. Flowers small or middling-sized, pedicelled, in poor axillary clusters or solitary.

Leaves rounded or retuse at apex; flowers solitary, small; berries large, depressed-globular . . . . . *M. littoralis.*
Leaves bluntish acuminate or apiculate; flowers clustered, conspicuous; anthers very acuminate; berries oval . . . . *M. Elengi.*

1. M. littoralis, Kz. (*M. Indica,* Kurz And. Rep.; Brand. For. Fl. 292).—*Kap-pa-lee.*—An evergreen tree (50—80+30—60+12—15), all parts quite glabrous, the branchlets very thick and scared; bark thin, rather smooth, blackish brown; leaves crowded, obovate to obovate-oblong, on a slender petiole ½-1 in. long, more or less acute at the base, thin-coriaceous, 2½-4 in. long, blunt and usually retuse, glabrous, glossy above, the lateral nerves crowded, thin, the net-veination minute; flowers small, on ½ to ¾ (in fruit nearly 1½) in. long, robust, almost glabrous pedicels, solitary, axillary; calyx about 2 lin. long, 6- (and also 8- ?) -lobed, the lobes ovate, rather blunt; corolla-lobes 3 times as many as calyx-lobes, the outer series consisting of 12 linear-lanceolate lobes, the inner of 6 erect, shorter, narrower, at the base tapering segments opposite and almost adnate to the base of the filaments; stamens twice as many as calyx-lobes, glabrous, alternating with as many scale-like minute-toothed scales; anthers acuminate; ovary tawny-pubescent; berries depressed-globular, about 1-1½ in. across, smooth, usually 5- or 6-celled and -seeded, the seeds compressed-oblong, about ½ an in. long, with a conspicuous oblique almost basal hilum.

Hab.—Common in the tropical forests along the coast of the Andamans; also in Upper Tenasserim.—Fl. June-July; Fr. C.S.—s.—SS.=SiS.

Remarks.—Wood reddish or pinkish brown, the sapwood lighter-coloured rather narrow-streaked, very close-grained, very hard and durable, heavy. The so-called Andaman bullet-wood, used especially for gun-stocks, etc.

2. M. Elengi, L.; Bedd. Sylv. Madr., t. 40; Brand. For. Fl. 293.—*Khayah.*—An evergreen tree (40—50+15—30+4—7), the young shoots minutely and indistinctly greyish- or tawny-puberous; bark rather coarse, brittle, longitudinally and deeply cracked, with transverse fissures, brown; leaves alternate or nearly so, on a slender petiole 1-½ in. long, elliptically oblong to ovate-oblong, 3-4 in. long, bluntish acuminate, thin coriaceous, glabrous, above glossy with a metallic lustre, the lateral nerves thin and parallel, the net-veination between lax; flowers conspicuous, white, very fragrant, on 4-6 lin. long tawny-velvety pedicels, by 2-8 clustered or occasionally solitary, axillary; calyx 8- (occasionally 6-) parted, the lobes lanceolate, acuminate, the outer ones tawny- the inner whitish-velvety; corolla-lobes 3 times as many as sepals, the outer series consisting of 16 (occasionally 12) linear spreading segments, the inner of 8 (occasion-

ally 6) erect-connivent shorter segments opposite the stamens; stamens as many as sepals, alternating with as many linear-lanceolate, acuminate, toothed, scale-like staminodes hairy at the base; filaments hairy; anthers very acuminate; berries ovoid, when ripe yellow and edible, smooth, about $\frac{1}{2}$-$\frac{3}{4}$ in. long, by abortion 1-seeded; seed oblong, compressed.

Hab.—Common in the tropical forests of the Andamans; also Martaban and Tenasserim; in other parts of Burma frequently cultivated in villages.—Fl. Feb. and Sept.—s.—SS.=SiS.

Remarks.—Wood reddish brown, close-grained, heavy, very hard and durable, takes a beautiful polish.—□'=61 pd.—Good for house-building and furniture, and said to last 50 years. Yields the pagoda-gum of Madras.

3. **M. parvifolia,** Kz.—Probably a small evergreen tree, the young shoots tomentose; leaves oval to obversely oval, resembling much those of *Sapota elengoides,* acute at the base, on a slender up to $\frac{1}{2}$ an in. long petiole, retuse or nearly so, entire, chartaceous, glabrous; flowers like those of *M. kauki,* on long, glabrous, tolerably thick pedicels; sepals 6, in two rows; petals linear-lanceolate.

Hab.—Ava.—Fl. Jan.

EBENACEÆ.

Flowers regular, usually dioecious, rarely hermaphrodite. Calyx 3- to 7-lobed, persistent, in the females usually enlarging. Corolla gamopetalous, deciduous, 3-7-lobed, the lobes always sinistrorsely convolute-imbricate in bud. Stamens in the females either none or as many or twice as many as corolla-lobes, distinct and inserted at the base of the corolla-tube; in the males 6 or more, usually 16, distinct or often united by pairs, inserted at the base of the corolla-tube or rarely hypogynous, or partly inserted in the corolla, partly on the torus, the inner series usually shorter or wanting; filaments short, usually pilose and ligulate; anthers basifix, 2-celled, opening by longitudinal slits. Ovary 3-14-celled, the cells with a solitary or 2 collateral ovules suspended from the summit of the inner angle; styles half the number of the cells and 2-lobed, or as many as cells and simple. Berry by abortion often few-celled and few-seeded, fleshy or coriaceous, the rind sometimes rupturing into as many valves as calyx-lobes. Seeds pendulous, usually solitary in the cells, often compressed, the testa smooth, coriaceous. Albumen horny, homogeneous or ruminate. Embryo axile or somewhat oblique, straight or curved at the apex, the cotyledons leafy, nearly as long as the superior cylindrical radicle.—Trees or shrubs, rarely undershrubs, with alternate or very rarely almost opposite simple leaves, the juice watery. Stipules none. Flowers in axillary or

rarely terminal cymes, the females usually larger and turning solitary by abortion of the lateral flowers.

An order important to the forester on account of ebony-wood, the produce of several species of *Diospyros*. The fruits of a few are edible, but of an inferior quality, and those of a few others serve for dyeing black. All the Burmese species are trees.

Calyx 4-parted to near the base; corolla 4-lobed; ovary-cells as many as corolla-lobes; male and female flowers all solitary . . . . . *Gunisanthus.*
Calyx 4-6 toothed or-lobed; corolla-lobes 4 to 6; ovary-cells twice as many as lobes, with a solitary ovule in each cell; male flowers clustered or cymose, the females solitary . . . *Diospyros.*
Calyx- and corolla-lobes 3; ovary-cells as many, with 2 ovules in each cell . . . . . *Maba.*

GUNISANTHUS, DC.

Flowers dioecious. Calyx 4- or 5-parted, the lobes narrow; corolla funnel-shaped, the limb 4- or 5-lobed, the lobes spreading, sinistrorsely twisted in bud. Stamens in females wanting, in the males twice as many as corolla-lobes, in 2 series, the inner ones shorter and perigynous, with very unequal filaments, those of the outer series longer; anthers with an acute or acuminate connective, opening by longitudinal slits. Ovary in males rudimentary, in the females 4- or 5-celled, the cells with a solitary ovule; style very short, 2-lobed. Berry rather dry, supported by the usually reflexed calyx-lobes, 4- or 5- or by abortion fewer-celled. Seeds compressed-oblong, with a thin black testa.—Small usually hairy trees; flowers in slender cymes.

Not flowering branchlets sparingly pubescent, along with the leaves glabrescent; calyx-tube doubly shorter than the corolla-lobes . . . . . *G. pilosulus.*
Not flowering branchlets densely villous; leaves permanently softly pubescent beneath; calyx-tube a little shorter than the corolla-lobes . . . . . *G. mollis.*

1. **G. pilosulus**, DC.—An evergreen tree (15—25 + 8—10 + 1—1½), all the younger parts appressed-pubescent from long soft hairs; leaves variable, from obovate-oblong to elongate elliptically oblong and oval, on a 1-2 lin. long petiole, 1-2 in. or sometimes 3 to 4 in. long, bluntish acuminate or apiculate, chartaceous, entire, while young appressed-pubescent, glabrescent, the midrib beneath usually remaining pubescent; flowers middling-sized, dull-orange or yellow inside, softly appressed-pubescent outside, on 4 to 6 lin. long, straight, pilose pedicels, arising from short pilose branchlets and often appearing racemose after the fall of the leaves; calyx-lobes oblong-lanceolate, about 3 lin. long; corolla-lobes twice as long as the short ovate tube; berries (unripe) the size of a small cherry, globular, sparingly hispid, brown and dry.

Hab.—Not unfrequent in the tropical forests of the Andamans; also in those of the Pegu Yomah.—Fl. Apr.—Fr. May-June.—s.—SS.=Metam. SiS. (?).

2. **G. mollis**, Kz.—An evergreen tree (20—30+8—10+1½—2), the branches densely villous, the softer parts all softly pubescent; bark dark-greenish-grey, about a line thick, smooth; cut brown; leaves on a line long petiole, narrowly oblong or oblong-lanceolate, and often somewhat narrowed towards the obtuse base, 3-4 in. long, bluntish acuminate, chartaceous, above along the midrib and beneath all over softly pubescent; flowers rather conspicuous, ochre-yellow, densely pubescent outside, on 4 to 6 lin. long pilose pedicels, forming rather short pilose racemes after the fall of the leaves; calyx-lobes linear-lanceolate, about 3 lin. long, much shorter than the tube; corolla-lobes somewhat longer than the calyx-tube, oblong-lanceolate; female flowers and fruits not yet known.

Hab.—Not unfrequent in the tropical forests of Martaban east of Tounghoo. —Fl. March.—s.—SS.=Metam.

Remarks.—Wood red-brown, rather heavy, of a short fibre, close-grained, rather soft, soon attacked by xylophages.

DIOSPYROS, L.

Flowers unisexual, rarely hermaphrodite. Calyx 4- or 5- rarely 6-lobed, or very rarely irregularly cleft. Corolla urceolate, salver- or bell-shaped, with as many lobes as calyx-lobes, twisted in bud. Stamens in females fewer, usually as many or twice as many as corolla-lobes, with pollenless anthers, in the males 2-4 times as many as corolla-lobes, very rarely indefinite or as many as lobes, inserted at the very base of the corolla-tube, or partially in the tube and partially on the torus, or more usually all on the torus; filaments often unequal, usually shorter than the anthers, those of the outer series usually longer; anthers opening by lateral longitudinal slits. Ovary in males more or less rudimentary, in females with twice as many cells as calyx-lobes, the cells with a solitary suspended ovule; styles 2 or 4, usually united at the base and often 2-lobed at the apex; stigmas punctiform. Berry usually supported by the persistent and often somewhat enlarged calyx, 3-10-12-celled. Seeds oblong, laterally more or less compressed; albumen horny, homogeneous or ruminate. Embryo axile, straight; cotyledons leafy.—Trees, rarely shrubs, the heartwood often very hard and black, with alternate or very rarely opposite simple leaves. Male flowers usually smaller, racemose or cymose, axillary or from the older branches or stem; female ones usually solitary and shorter-peduncled.

* *Calyx in bud globular and closed, the lobes connate, afterwards irregularly bursting into 2 or 3 lobes; corolla tubular, 5-lobed; stamens 16 or more.*

Glabrous; leaves coriaceous and elegantly net-veined; flowers conspicuous, about 4 lin. long, very coriaceous . . . *D. toposia.*

* * *Calyx in males short and truncate-toothed, in females large, deeply lobed; corolla urceolate, the lobes notched; anthers 30-50; ovary-cells twice as many as corolla-lobes.*

Glabrous; leaves coriaceous . . . . . *D. embryopteris.*

* * * *Calyx toothed or lobed; corolla-lobes not notched; anthers about 20 or fewer; ovary-cells twice as many as corolla-lobes.*

○ *Corolla urceolate, in bud short, globular or conical, the tube short and swollen, the lobes usually rounded and short; ovary-cells twice as many as corolla-lobes.*

× *Flower-buds globular; corolla quite glabrous; flowers small, hardly a line long.*

Leaves thin-chartaceous, with strong prominent nerves, the net-veination distinct, lax; ovary glabrous . . . . *D. chartacea.*

Leaves thin-coriaceous, the nerves strong, the net-veination inconspicuous; ovary tawny-villous . . . . . *D. ehretioides.*

× × *Flower buds conical, acute, but never elongate.*

† *Leaves more or less puberulous or pubescent, at least while young.*

Flowers about 3-4 lin. long, in short-bracted cymes; leaves tapering at base, pubescent (at least beneath) . . . . *D. mollis.*

Flowers 1-2 lin. long; peduncles thin and slender; leaves rounded or cordate at base, densely puberulous (at least beneath) . *D. cordifolia.*

† † *Leaves quite glabrous and glossy.*

Leaves drying blackish, the nerves thin but prominent; peduncles ½ to a line long . . . . . *D. Kurzii.*

Leaves in a dried state glaucous-green, almost polished and the nerves very inconspicuous and impressed, without net-veination; peduncles 4 to 5 lin. long; flowers nearly 5-6 lin. long . *D. oleifolia.*

○ ○ *Corolla salver-shaped, in bud elongate, very seldom short (in D. Birmanica), the tube not or almost not widened, the lobes as long or nearly as long as the tube.*

× *Calyx-lobes with their borders reflexed or revolute, at least at their bases, and, therefore, often appearing somewhat auricled.*

‖ *Flowers 5-merous.*

Along with the short peduncles tawny-tomentose; leaves coriaceous, afterwards shortly pubescent beneath; berry globular . *D. Birmanica.*

Flowers sessile; leaves thin-chartaceous, glabrescent . . . *D. rhodocalyx.*

‖ ‖ *Flowers 4-merous, 4-angular in bud; leaves glabrous.*

Peduncles long, the cymes often compound; leaves with obsolete net-veination; berries globular . . . . . *D. densiflora.*

Cymes large, corymb-like, fuliginous-velvety, bracted; leaves strongly but laxly net-veined; berries globose . . . *D. Horsfieldii.*

Flowers short-peduncled, clustered; leaves indistinctly net-veined; berries elliptical . . . . . *D. flavicans.*

Flowers sessile or nearly so; leaves with lax but distinct net-veination; berries globular, rusty-pubescent . . . . *D. undulata.*

As former, but ovary glabrous . . . . . *D. sapotoides.*

× × *Calyx-lobes plain*, i. e. *the borders not reflexed nor revolute.*

† *All parts except the very young shoots quite glabrous. Flowers almost sessile.*

Flowers rusty-tomentose; calyx short, with acute lobes; leaves strongly net-veined; berries tawny-tomentose; corolla 4-gonous in bud . . . . . *D. lanceæfolia.*

Male calyx campanulate, with rounded short lobes, tomentose; leaves strongly net-veined; berries rusty-tomentose; corolla terete in bud . . . . . *D. pyrrhocarpa.*

Calyx ample, puberulous, with rounded lobes; male cymes very short and robust; leaves strongly net-veined (berries glabrous?); corolla terete in bud . . . . . *D. variegata.*

†† *All parts, especially the leaves, more or less pubescent or otherwise hairy; male flowers in cymes; berries glabrous.*

Leaves not cordate, softly pubescent beneath; calyx-lobes and bracts acute; flowers 4-merous . . . . . *D. stricta.*

Leaves not cordate, when full-grown almost glabrous and chartaceous; calyx-lobes linear-lanceolate; cymes branched, arising from the stem or older branches; flowers 5-merous . . *D. Brandisiana.*

Leaves with cordate base, softly pubescent; calyx-lobes and bracts rounded; cymes short, robust; flowers 4-merous . . . *D. dasyphylla.*

1. **D. toposia,** Ham.; Bedd. Sylv. Madr. 144.—An evergreen tree, all parts glabrous; leaves elliptically oblong to lanceolate, on a 2-3 lin. long petiole, 3-6 in. long, bluntish acuminate, entire, chartaceous or almost coriaceous, glabrous, elegantly and densely net-veined; flowers yellow, 4-5 lin. long, almost globular in bud, on 1-2 lin. long nodding pedicels, forming glabrous, robust, short-peduncled, 3-5-flowered cymes in the axils of the leaves, the hermaphrodite-female ones solitary; bracts, if any, very deciduous; calyx very coriaceous, deeply 4- occasionally 3-cleft, the lobes oblong-ovate, acute; corolla urceolate, with an oval tube, 4-lobed, the lobes short, ovate, somewhat acute; stamens in the males from 20-30, in hermaphrodites 12-16, the filaments very short; anthers linear, acute, glabrous; ovary in hermaphrodites conical, glabrous, 4-celled, with 4 short stigmas; berries globular, about an inch in diameter, smooth, up to 4-seeded, the calyx but little enlarged; albumen homogeneous.

HAB.—Chittagong.

2. **D. embryopteris,** Pers.; Bedd., Sylv. Madr., t. 49; Brand. For. Fl. 298.—An evergreen tree (40—60 + ?) all parts glabrous, the leaf-buds tawny or yellowish pubescent; leaves linear- and elliptically-oblong to oblong-lanceolate, on a $\frac{1}{2}$-$\frac{2}{3}$ in. long petiole, 5-7 in. long, blunt or acuminate, entire, coriaceous, smooth and shining, the nerves and the lax net-veination conspicuous; flowers middling-sized, yellowish white, 4-merous, on 2-3 lin. long thick pedicels, the males in poor, drooping, somewhat velvety-tomentose cymes in the axils of the leaves, the hermaphrodites considerably larger and solitary; bracts small, very deciduous; males: calyx very short and flat almost 4-angular-expanded, shortly sinuate-4-toothed, tawny-vel-

vety; corolla smooth, in bud about 3 lin. long, with an oval tube, the lobes rounded, blunt or notched; stamens about 40, united by pairs; filaments very short; anthers elongate-linear, acute; females: calyx deeply 4-lobed, nearly ½ in. long, the lobes broadly ovate, acute; corolla almost bell-shaped, nearly an inch in diameter, the tube very short; staminodes 4 or fewer, inserted at the base of the corolla-tube; ovary globular, 8-celled, with 4 spreading generally 3-cleft styles; berries globular, about the size of a small apple, pulpy within, yellow when ripe and covered with a rusty-coloured mealy substance, up to 8-seeded, surrounded at the base by the large 4-leafed calyx; albumen homogeneous.

Hab.—Martaban and Tenasserim, apparently not unfrequent.—Fl. Aug.; Fr. Feb.-Apr.

3. **D. chartacea,** Wall.—An evergreen, small, shrubby tree, the trunk as thick as a man's thigh, all parts quite glabrous; bark about 2 lin. thick, blackish, roughish; cut pale-coloured; leaves ovate-oblong to oblong and oblong-lanceolate, on a 1-2 lin. long petiole, 4-5 in. long, bluntish acuminate or somewhat acute, entire, chartaceous and thin, glabrous, shining above; flowers small, cream-coloured, 4-merous, glabrous, sessile, forming short, rather dense, minutely puberulous racemes or clusters in the axils of the leaves or above the scars of the fallen ones, the females unknown; bracts ovate, acute, more or less minutely ciliate; calyx shortly bell-shaped, whitish, the lobes oblong and blunt, about a line long; corolla-tube wide and a little longer than the calyx, the lobes ovate, blunt, somewhat shorter than the tube; stamens in males 16-20, by pairs; anthers linear-oblong, acute, pubescent, whitish; the filaments short, the inner ones still shorter; ovary-rudiment glabrous.

Hab.—Not uncommon in the tropical forests of Martaban and Upper Tenasserim.—Fl.-March-Apr.—s.—SS.=Metam.

Remarks.—Sapwood whitish, rather heavy, fibrous and tough, soon attacked by xylophages.

4. **D. ehretioides,** Wall.—*Ouk-cheng-za.*—A tree (60—70+25—40+5—6), leafless during H.S., all parts glabrous; bark about ⅔ in. thick, dark grey, corky and fissured; cut reddish; leaves elliptical to oblong, on a ⅓-½ in. long petiole, rounded or obtuse at the base, 4-6 in. long, blunt or nearly so, entire, chartaceous, glabrous, pale-coloured (in a dried state brown) beneath; flowers small, 4-merous, the males smaller, white, on 1-1½ lin. long puberulous pedicels, forming short, densely puberulous, branched, almost sessile, often trichotomous cymes above the scars of the fallen leaves, the females rose-coloured, larger, solitary, on 3-4 lin. long, puberulous, minutely 2-bracted peduncles along the axillary young leafless shoots, and hence appearing as if racemose; calyx sparingly and

minutely puberulous, the lobes oblong, blunt; corolla urceolate, glabrous, the lobes rotundate (not ciliate); stamens in males about 20, inserted at the base of the corolla-tube, in the females none; anthers oblong-lanceolate, acuminate; filaments short; ovary shortly tawny-villous, globular, 8-celled, in the males rudimentary; berries globular, about the size of a very large cherry, smooth, with a rather thick rind, yellow, soon turning brown, supported by the hardened calyx.

Hab.—Frequent all over Burma from Ava and Martaban down to Pegu, in the leaf-shedding; especially the mixed, forests, up to 3,000 ft.—Fl. Apr.-May; Fr. Dec.-Jan.—l.—SS.=∞ *SiS.*

Remarks.—Sapwood yellowish white, of a very coarse granular appearance, rather hard, the heartwood rather heavy, brittle, close-grained, brown or beautifully white and black mottled. □ ′=41 pd.—Used for house-posts.

5. **D. mollis,** Griff.—A tree (25—30 + 5—20 + 2—7), remaining stunted in higher regions, the branchlets and all younger parts softly pubescent; leaves alternate, bifarious, from ovate to oblong- and obovate-lanceolate, on a slender pubescent petiole 2-3 lin. long, more or less acuminate, 2-5 in. long, entire, membranous, while young on both sides pubescent, glabrescent above, pale-coloured beneath; flowers small, pale yellow, the males shortly pedicelled, forming densely pubescent, short, 3- or more (very rarely 1-) -flowered cymes in the axils of the leaves or at the base of the young shoots, the females solitary and very shortly peduncled; bracts small, deciduous; males: calyx densely and softly pubescent, 4-cleft, the lobes ovate-oblong, acute, nearly as long as the short, wide corolla-tube; corolla urceolate, 4-lobed, the lobes about as long as the tube, almost orbicular and notched, yellow; stamens 16-24 or more, inserted in several rows to the base of the tube; anthers sagittate, the cells minutely bearded at the base; filaments short; ovary-rudiment conical, gland-like, villous, or wanting; females unknown, but the calyx in fruit 4-lobed, the lobes half-deflexed, thick-coriaceous, rounded, concave underneath, sometimes almost conduplicate; ovary 8-celled; styles 4, short, erect, truncate, pubescent; berries globular, the size of a largish cherry, somewhat depressed and umbilicate at the apex, smooth, surrounded at the base by the indurated calyx, usually 1-seeded by abortion; albumen homogeneous.

Hab.—Frequent in the drier hill forests of Martaban, at 2,000 to 4,000 ft. elevation; Ava, Kakhyen hills.—Fl. March.—l.—SS.=Metam.

Remarks.—The berries produce the so-called black-dye of shans.

6. **D. cordifolia,** Roxb.; Bedd. Sylv. Madr. 143.—*Chope-pen.*—A tree (30—50 + 6—15 + 4—6), leafless in H.S., while young often armed with simple and compound spines, all younger parts softly puberulous; bark dark brown, rough; leaves variable in size and

shape, from ovate and oval-oblong to cordate and elliptically-oblong, on a densely puberulous, slender petiole 2-3 lin. long, cordate or rounded at the base, 1-3 in. long, blunt or more or less acute to acuminate, membranous, entire, especially beneath densely and shortly pubescent, the nerves impressed above; flowers small, yellowish, 4-merous, the males pedicelled and by 3 or more, forming shorter or longer peduncled, recurved, slender, puberulous cymes in the axils of the leaves, the females much larger and solitary on a 3-5 lin. long peduncle; calyx densely puberulous, the lobes ovate, blunt, about a line long (in the females twice as long); corolla urceolate, glabrous, the lobes oblong, about as long as the tube; stamens in the males about 16, in pairs, inserted at the base of the corolla-tube, in the females only 12 and all singly; filaments very short; anthers linear-oblong, blunt; ovary 8-celled; styles 4, 2-lobed; berries globular, the size of a large cherry to that of a small lime, yellowish brown, smooth, 8- to 5-seeded, the rind rather thick; albumen homogeneous or ruminate outside.

Var. 2, **heterophylla** (*D. heterophylla*, Wall.): leaves very variable in shape and size, from oblong to obovate, usually quite glabrous or very slightly puberulous and soon glabrous, glaucous beneath.

Hab.—Var. 1: not unfrequent in the mixed and low forests of the Pegu Yomah; var. 2: frequent in the dry and Eng forests of Ava and Prome.—Fl. March-Apr.; Fr. Dec.-Feb.—l.—SS.=var. 1: SiS. Arg.; var. 2: CaS. Lat.

Remarks.—Wood pale brown, rather heavy, close-grained, the heartwood small, blackish, takes fine polish.—$\pi' = 49$ pd.

7. **D. Kurzii,** Hiern.—An evergreen tree (50—60+25—30+4—6), the leaf-buds and very young shoots pubescent; bark very thin, smooth, greyish; leaves ovate to elliptically oblong and ovate, on a very short, thin, puberulous petiole, 2-3 in. long, long but bluntish acuminate, entire, chartaceous, glossy, glabrous, the midrib beneath usually pubescent, the nerves thin; flowers small, white, on very short puberulous pedicels or almost sessile, the females only known, which form by 3 or 2 a very short peduncled, puberulous, small cyme in the axils of the leaves; bracts small, linear, pubescent, very deciduous; calyx glabrous or nearly so, deeply 4-cleft, the lobes about a line long, broadly ovate, somewhat acute; corolla velvety outside, about 2 lin. long, 4-lobed, the lobes oblong-ovate, acute, the tube very short; stamens in females reduced and rudimentary, inserted at the base of the corolla-tube; ovary oblong, glabrous, with a thick simple style; berries globular, the size of a small cherry, smooth, 4-celled, up to 4-seeded, the seeds minutely wrinkled; albumen homogeneous.

Hab.—Frequent in the tropical and moister upper mixed forests of the Andamans.—Fl. May-June; Fr. Apr.—s.—SS.=SiS., etc.

Remarks.—Wood greyish, the heart wood small, ebony-like, close-grained, heavy, black, or the grey wood interlaid with black wood-layers and then called marble-wood.

8. **D. ramiflora,** Roxb.—An evergreen tree (40—50+15—20+4—5), all parts glabrous, the leaf-buds sparingly silk-hairy; bark smooth, dark olive-brown; leaves oblong to elliptically oblong and oblong-lanceolate, on a strong 3-4 lin. long petiole, 3-6 in. long, abruptly bluntish acuminate, entire, coriaceous, glabrous, the nerves and the lax veination thin; flowers middling-sized, usually 5- rarely 6- or 4-merous, on thick $\frac{1}{3}$-$\frac{1}{2}$ in. long shortly brown-tomentose pedicels, in small cymes reduced to clusters arising from the older branches; bracts small, persistent, cinnamon-velvety; calyx very coriaceous, 3 lin. deep, almost urceolate, brown-velvety, 5- (4- or 6-) -lobed, the lobes short, triangular, acute; corolla urceolate, $\frac{1}{3}$-$\frac{1}{2}$ in. long, white, velvety outside, the lobes short, almost orbicular; stamens in females infertile, about twice as many as calyx-lobes, inserted at the base of the corolla-tube; ovary rusty-hairy, with twice as many cells as there are calyx-lobes; stigmas 5 (or 4 or 6), short, blunt; berries globose, the size of an apple, somewhat roughish, brown, supported by the very thick enlarged calyx, with as many or fewer seeds than ovary-cells; albumen homogeneous.

Hab.—Rather rare in the tropical forests of Arracan; also Chittagong.—s.—SS.=SiS.

9. **D. oleifolia,** Wall.—*Chope-pen.*—An evergreen tree (40—60+12—25+3—4), all parts quite glabrous; bark about a line thick, ash-grey or dark brown, smooth, with scattered rusty-coloured rather large lenticels; leaves elliptical to oblong and oblong-lanceolate, bluntish acuminate, on a 2-3 lin. long petiole, 3-5 in. long, almost coriaceous, smooth and polished on both sides, the nerves very faint, impressed or almost invisible; flowers rather small, white, 4-merous, shortly pedicelled, usually by threes on a 3-6 lin. long slightly pubescent peduncle in the axils of the leaves, the females solitary on very short, nodding, pubescent peduncles; calyx nearly 3 lin. long, glabrous outside, densely tawny-tomentose inside, the lobes broad, acute; corolla tawny-tomentose outside, more than double the length of the calyx, the tube wide and inflated, about 3-3$\frac{1}{2}$ lin. long, the lobes short, rotundate; stamens in the males about 20, inserted at the very base of the corolla-tube and on the torus; filaments inconspicuous; anthers linear, acuminate, about 2 lin. long; ovary-rudiment minute, tawny-pubescent; females: calyx 4-parted, the lobes triangular, acute, velvety outside, densely tawny-tomentose inside; young fruits oval, densely tawny- or rusty-tomentose.

Hab.—Frequent in the tropical forests of Martaban and Tenasserim.—Fl. March-Apr.—s.—SS.=Metam.

Remarks.—Sapwood white or yellowish white, heavy, fibrous, close-grained, soft.

10. **D. Burmanica,** Kz.—*Tai-pen.*—A tree (50—60+20—30+4—6) remaining often stunted, leafless in H.S., all younger parts appressed tawny-pubescent; bark rough, blackish, peeling off in concentric rounded pieces; cut reddish; leaves elliptical to elliptically oblong, on a puberulous 1-1½ in. long petiole, 2½-4 in. long, shortly and bluntish acuminate or blunt, entire, more or less coriaceous, while young covered above with a fugaceous thin tomentum, and beneath densely tawny-pubescent, at length glabrescent above and turning densely puberulous beneath, the nerves and net-veination thin; flowers rather small, densely tawny-tomentose, in tomentose short cymes, the females solitary on 2-3 lin. long densely tomentose peduncles, arising from above the scars of the fallen leaves or along the young leafless shoots and forming a spurious lax raceme; calyx densely tawny-tomentose, usually 5- (rarely 4- or 6-) -lobed, nearly 3 lin. long, the lobes broadly cordate-ovate, rather acute, with their borders recurved; corolla densely appressed tawny-pubescent, glabrous inside, the tube short, the lobes as long as the tube; stamens in males usually 14-16; anthers linear, acute, longer than the filaments, in the females reduced to 8 and infertile, inserted at the base of the corolla-tube; ovary in the males rudimentary, tawny-pubescent, in the females densely tawny-pubescent, narrowed in a short thick style terminated by 2 thick, 2-lobulate, sessile, glabrous stigmas; berries globose, about an inch in diameter, up to 4-seeded, smooth, yellowish brown, supported by the enlarged calyx; albumen ruminate outside.

Hab.—Common in the dry and open forests, especially in the Eng forests, of Prome and Ava; less frequent all over Pegu and Martaban.—Fl. March-Apr.; Fr. Dec.-Jan.—l.—SS.=Dil. CaS.

11. **D. rhodocalyx,** Kz.—A small tree, the young shoots appressed-pubescent; leaves oblong to oval-oblong, rarely obovate-oblong, retuse or sometimes bluntish apiculate, on a short and slender, appressed-pilose petiole, acute or obtuse at the base, greatly varying in size (1-2 or 3-4 in. long), chartaceous, glabrous and glossy, beneath usually appressed-pilose on the nerves, the nerves and the lax net-veination on both sides conspicuous; flowers 4-merous, small, sessile or nearly so, axillary, the males in very short tomentose cymes, the females solitary or almost spicate on short leafless axillary shoots; bracts linear, short, densely tawny-tomentose; calyx densely appressed-pubescent, the lobes oblong-lanceolate, bluntish, larger and broader in the females, dilated-reflexed, and nearly 3 lin. long; corolla glabrous, in males hardly 2 lin., in the females nearly 3 lin. long, the tube inflated, the 4 lobes short,

oblong; stamens in males about 16, in females 8-10, inserted at the very base of the corolla-tube; filaments short, bearded; anthers linear, acuminate; ovary in males rudimentary, in the females oblong, densely tawny-tomentose, 4-celled (?).

Hab.—Adjoining provinces of Siam.—Fl. H.S.

12. **D. densiflora,** Wall.—An evergreen tree, all parts glabrous; leaves elliptical to oblong, on a thick ½-⅔ in. long petiole, 4-6 in. long, shortly acuminate or acute, thin-coriaceous, glabrous, glossy on both sides, entire; flowers in bud about ⅔ in. long, 4-merous, on shortly tomentose bracted pedicels, both sexes forming longer or shorter peduncled densely and shortly rusty-tomentose bracted cymes, either solitary or several together in the axils of the leaves or above the scars of the fallen leaves; bracts oblong, small, tomentose; calyx densely and shortly rusty-tomentose, deeply 4-cleft, the lobes oblong, blunt with revolute margins; corolla densely tawny-tomentose, the tube 4-cornered, somewhat longer than the calyx-lobes, little widened, the lobes about 2-2½ lin. long, oblong; stamens in the males 15-16; filaments very short, hairy; anthers glabrous, linear-oblong, acute, in the females reduced in number to about 10, smaller and infertile; ovary tawny-villous, in the males rudimentary; berries globose, nearly an inch in diameter, tawny-puberulous and glabrescent, supported by the large penni-nerved revolute-bordered calyx-lobes.

Hab.—Rather rare in the tropical forests of Arracan and Martaban; also Tenasserim.—Fl. Feb.; Fr. March.—s.—SS.=Metam.

13. **D. Horsfieldii,** Hiern.—An evergreen tree, all parts glabrous; leaves oblong to ovate-oblong and elliptical, rounded or obtuse at the base, on a strong petiole ¼-⅓ in. long, acuminate, chartaceous, 4-9 in. long, glabrous, above green and glossy, beneath brownish and strongly but laxly net-veined; flowers largish, forming much-branched, cinnamon-velvety, bracted, corymb-like cymes arising usually from above the scars of the fallen leaves or from the older branches; pedicels in females stiff, about ½ in. long, often 2-bracted towards the base; calyx cinnamon-velvety, 4-lobed, the lobes broadly ovate, revolute with the margins, in the females ⅓ in. long or longer; corolla urceolate, 4-gonous, velvety outside, 4-lobed, the lobes ovate, rather blunt; stamens in the males 14-16, inserted at the base of the corolla-tube or on the disk, often united by pairs, the filaments short, hairy; anthers glabrous; in females 12, in a single row, pollenless; ovary in males rudimentary, in the females densely velvety and hirsute, 8-celled; styles 4, short, spreading; berries globose, depressed on the apex, ½-¾ in. thick, black-hairy or nearly glabrescent, the supporting calyx reaching nearly up to half an inch with its lobes auricled at the base.

Hab.—Tenasserim.

14. **D. flavicans,** Hiern.—An evergreen small tree, or large shrub 8-10 ft. high, the very young shoots slightly pubescent; leaves elliptically to oblong-lanceolate and oblong, often a little oblique, on hardly a line long petiole, 2-3 in. long, bluntish acuminate, thin-coriaceous, entire, smooth, the nerves faint without net-veination; flowers rather large, usually 4-merous, white, usually solitary or by 2, rarely more, on short, tawny-pubescent, large-bracted peduncles or almost sessile in the axils of the leaves; bracts obovate-lanceolate, densely appressed-pubescent, acute, 3-4 lin. long; calyx appressed tawny-pubescent, more or less glabrescent, 4- (rarely 5-) -cleft, the lobes ovate, acuminate, unequal, 2 of them larger and nearly 3 lin. long; corolla in bud 4-gonous, ½ an inch long, the tube 4-cornered, inflated, as long as the calyx, pubescent at the narrowed neck, the lobes glabrous, as long as the tube; stamens 12-20, inserted by twos in two rows at the base of the corolla-tube, the inner row half as long, in the females fewer and inserted higher up in the tube; filaments rather short; anthers ovate, acuminate; ovary in the males absent, in the females 4-angular-ovate, glabrous, terminating in an erect 2-lobed style; berries oblong, about ⅔ in. long, blunt, up to 4-seeded, supported by the somewhat enlarged appressed calyx.

Hab.—Tenasserim.

15. **D. undulata,** Wall.—An evergreen large tree, all parts glabrous, or the very young branchlets fugaceously tawny-pubescent; leaves oblong to elliptical, on a ⅓-½ in. long petiole, 4-6 in. long, apiculate, entire, chartaceous, while very young covered beneath with very fugaceous tawny or rusty-coloured hairs, soon quite glabrous and shining, the net-veination very lax and thin; flowers yellow, 4-merous, sessile, the males forming very short, bracted, densely tawny-pubescent, axillary racemes, the females solitary or rarely by 2-3 and almost sessile amongst the bracts in the axils of the leaves; bracts ovate, acute, densely villous; calyx tawny-pubescent, 4-cleft, the lobes as long as the tube, oblong, somewhat acute; corolla tawny-pubescent outside, the tube a little longer than the calyx, ovoid-urceolate, the lobes rotundate, about a line long; stamens in the males 16, by pairs, inserted at the very base of the corolla-tube, the inner ones smaller; anthers linear-oblong, acute, rusty-pilose at the base; filaments very short; ovary hirsute, in the males rudimentary; berries globular, about an inch in diameter, covered with rusty-coloured appressed hairs, resting on the spreading densely pubescent calyx and supported by a very thick, hardly a line long, few-bracted peduncle; albumen homogeneous.

Hab.—In the tropical forests of Martaban, Tenasserim, and the Andamans. —Fl. Apr.-May; Fr. Oct.-Feb.—s.—SS.=Metam.

16. **D. sapotoides,** Kz.—An evergreen tree (40—50 + 15—25 + 3—4), the young shoots covered with a fugaceous rusty-coloured thin pubescence; bark smooth, greenish dark-grey; leaves elliptically oblong or elliptical, obtuse at the base, on a glabrescent thick petiole hardly ½ an in. long, 6-8 in. long, shortly and bluntish acuminate, entire, coriaceous, the net-veination very lax, faint and impressed; flowers 4-merous, yellowish white, resembling those of *D. sapota*, almost sessile, clustered on a very thick, short, axillary peduncle; calyx rusty-pubescent outside, the lobes ovate-lanceolate, with the margins reflexed and at the base auricle-like revolute, nearly 3 lin. long, acuminate; corolla-tube urceolate, nearly twice as long as the calyx, somewhat rusty-pubescent outside, the lobes obovate, nearly as long as the tube; stamens 14-16, in two rows, glabrous in the females about 12, unequal, inserted at the base of the corolla-tube; anthers ovate-lanceolate, acuminate, ovary in males absent, in females ovate, quite glabrous; the style tolerably long, 4-cleft.

Hab.—Frequent in the tropical forests of the eastern slopes of the Pegu Yomah.—Fl. Apr.—s.—SS.=SiS.

17. **D. lanceæfolia,** Roxb.—An evergreen middling-sized tree, glabrous, the leaf-buds appressed tawny-pubescent; leaves lanceolate to oblong, on a 2-3 lin. long petiole, 3-5 in. long, acuminate or apiculate, coriaceous, glabrous, the nerves impressed above, beneath prominent and the net-veination between rather dense; flowers rather small, 4-merous, yellowish white, sessile, the males in poor dense axillary clusters, the females solitary; calyx bell-shaped, densely rusty- or tawny-tomentose, the lobes oblong, acute; corolla outside silky-pubescent, the tube short and almost ovate-urceolate, about twice as long as the calyx-lobes, the lobes oblong, somewhat acute, about a line long; stamens singly, about 16, inserted on the torus, in the females reduced in number to 8-10 and inserted at the base of the corolla-tube; filaments short; anthers linear, mucronate; ovary in females densely tawny-pubescent, 8-celled; styles short, as many as cells; berries ovoid-oblong, shortly and densely tawny-pubescent, about an inch long, supported by the enlarged tawny-pubescent calyx and a few rotundate bracts.

Hab.—Upper Tenasserim.—Fl. March.

18. **D. pyrrhocarpa,** Miq.—An evergreen tree (50—60 + (?) + 6—8), glabrous, the leaf-buds appressed tawny-pubescent; leaves oblong to elliptically oblong and elliptically lanceolate, on a strong 3-5 lin. long petiole, 4-6 in. long, shortly and bluntish acuminate, rather coriaceous, entire, glabrous, the nerves and net-veination thin, but strong and conspicuous; flowers whitish, 4-merous, the females solitary, on very short tawny-tomentose peduncles; calyx velvety,

oblong bell-shaped, about 3 lin. long, the lobes rounded and very short; corolla shortly salver-shaped, tawny-tomentose, the tube somewhat longer than the calyx, ample, but hardly widened, the lobes about 2 lin. long, ovate, acute; stamens in males about 16, inserted on the torus, unequal; filaments short; anthers linear, acuminate; ovary densely tawny-pubescent, in the males rudimentary; berries (unripe) depressed-globose, the size of a large cherry, densely and shortly rusty-tomentose, supported by the enlarged reddish tomentose 4- or 5-lobed calyx, the lobes of which appear ovate, bluntish acuminate and very coriaceous.

(?) Var. 2, **Andamanica:** leaves oblong to linear-oblong, the lateral nerves faint and numerous.

Hab.—Var. 2: rather rare in the tropical forests of the Andamans.—Fl. May.—s.—SS.=Metam. SiS.

19. **D. variegata,** Kz.—A tree (60—70+30—40+4—6), shedding leaves in H.S., all parts quite glabrous; bark about 2-3 lin. thick, roughish, blackish; cut red; leaves elliptically oblong or oblong, sometimes somewhat unequal at the base, on a thick 2-4 lin. long petiole, 5-8 in. long, acute to acuminate, entire, chartaceous or thin-coriaceous, glabrous, the nerves and the lax net-veination beneath prominent and conspicuous, in a dried state remaining green-coloured; flowers small, yellow, 4-merous, in bud about 4-5 lin. long, elongate, on very short bracteolate pedicels, by 3 or a few in short-peduncled, minutely puberulous, bracted cymes in the axils of the leaves, or arranged along the young often leafless shoots in a sort of spurious raceme; bracts broad, rather acute, puberulous; calyx puberulous, deeply 4-cleft, the lobes broadly oblong, blunt, about 2 lin. long; corolla-tube urceolate, a little longer than the calyx-lobes, the lobes ovate, acute, as long as the tube; stamens in the males about 16, unequal, inserted at the base of the corolla-tube; filaments short; anthers linear, cordate at the base, acuminate, glabrous; females and fruits unknown.

Hab.—Not unfrequent in the moister upper mixed and the tropical forests of Pegu and Martaban, up to 1,000 ft. elevation.—Fl. Apr.—l.—SS.=SiS. *Metam.*

Remarks.—Sapwood white, turning greyish, heavy, fibrous, but close-grained, soft.

20. **D. stricta,** Roxb.—A large tree, the trunk perfectly straight, the younger parts all softly pubescent; leaves ovate-lanceolate to ovate, on a 1-2 lin. long petiole, 1-2½ in. long, acuminate, membranous or almost chartaceous, along the midrib above and beneath all over pubescent, glossy above; flowers small, 4-merous, white, sessile, the males forming very small, few-flowered, appressed tawny-pubescent, bracted spikes, the females solitary on a very short 2-bracted peduncle or almost sessile in the axils of the leaves;

bracts ovate, acute, about as long as the calyx, appressed-pubescent; calyx and corolla outside appressed-pubescent, the lobes of the former nearly a line long, ovate, acute; corolla-tube cylindrical and very slightly widened at the base, 2½ lin. long, the lobes somewhat shorter, oblong-lanceolate; stamens in the males 16, on the convex torus; anthers oblong, mucronate; berries ovoid-oblong, nearly 1½ in. long, glossy and smooth.

Hab.—Chittagong.

21. **D. Brandisiana,** Kz.—An evergreen tree, the young shoots shortly pubescent; leaves resembling those of *D. chartacea,* from oblong and elliptically oblong to oblong-lanceolate, rounded or acute at the base, on a 1-2 lin. long puberulous petiole, 4-6-8 in. long, acuminate, chartaceous, when full-grown glabrous or usually sparingly appressed-hairy along the principal nerves; flowers in bud 4-5 lin. long, 5-merous, on 1-2 lin. long tomentose pedicels elongating afterwards, forming rather dense, much-branched and minutely-bracted dark-brown or almost blackish tomentose cymes arising from the older branches or smaller ones from the axils of the leaves; bracts minute, tomentose, oblong-lanceolate; calyx covered with a dark, almost blackish brown, short tomentum, about a line long, 5-cleft, the lobes linear-lanceolate, acute; corolla appressed-pubescent, the tube 2½ lin. long, somewhat widened towards the base and usually 5-cornered, the lobes as long as the tube, oblong, blunt; stamens in the males about 16, inserted on the torus; filaments very short, pubescent; anthers linear, mucronulate, glabrous; in the females reduced to 5 staminodes inserted at the base of the corolla-tube; ovary densely tawny-pubescent, terminating in a rather long, thick, simple style, 10-celled; berries (very young) ovate, stylose-acuminate, shortly pubescent.

Hab.—Tenasserim; also Ava, Kakhyen hills.—Fl. Feb.-March.

22. **D. dasyphylla,** Kz.—An evergreen tree, the branchlets densely tawny-pubescent, all softer parts softly puberulous; leaves oblong to ovate-oblong, on a tawny-pubescent petiole 1-2 lin. long, rounded or almost cordate at the base, 4-6 in. long, acute or very shortly acuminate, chartaceous, while young long-fringed, afterwards softly puberulous beneath and along the nerves above; flowers in bud nearly 4-5 in. long, 4-merous, on short pedicels, the males forming short tawny-pubescent cymes in the axils of the leaves or more usually above the scars of the fallen ones; bracts almost orbicular, puberulous and ciliate, about a line long; calyx rusty-pubescent, to near the base 4-cleft, the lobes rotundate, blunt and fringed; corolla-tube appressed tawny- or rusty-pubescent, about 3 lin. long, tubular and little widened, the lobes as long as the tube, oblong, acute, greyish-velvety outside; stamens in the males about 16,

inserted at the base of the corolla-tube, the filaments very unequal, some of them 1-2 lin. long, others very short; anthers oblong, acute; ovary-rudiment in males tawny-hirsute.

HAB.—Martaban hills, at 4,000 ft. elevation.

MABA, Forst.

Flowers dioecious, very rarely monoecious or polygamous, usually 3- rarely 4-6-merous. Calyx bell-shaped or oblong, lobed or truncate. Corolla bell-shaped or tubular, sinistrorsely twisted. Males: stamens 3 to many; ovary rudimentary; females: staminodes none to many, usually few; ovary 3- or 6-celled, with 2 ovules in each cell; styles 3, connate; berry 3- or 2-celled, with as many seeds; seeds pendulous.—Trees or shrubs, with alternate simple leaves; flowers in cymes or solitary, axillary.

* Ovary glabrous, 6-celled, glabrous or nearly so . . *M. Merguiensis.*
* * Ovary densely pubescent, 3-celled.
Leaves small, glabrous; berries globular, the size of a pea . . *M. buxifolia.*
Leaves large, hirsute along the nerves beneath; berries oblong, more than an inch long . . . . . *M. Andamanica.*

1. **M. Merguiensis,** Hiern.—A small tree, glabrous or nearly so; leaves oblong or ovate-oblong, on a $\frac{1}{3}$-$\frac{1}{2}$ in. long petiole, rounded or slightly narrowed at the base, $2\frac{1}{2}$-$6\frac{3}{4}$ in. long, acuminate, almost membranous, glabrous, or sometimes the midrib puberulous beneath, the veins delicately raised on both sides; flowers very shortly pedicelled, in pubescent cymes, the males cymose-panicled; males: calyx $\frac{1}{16}$ in. deep, open, bell-shaped, shortly and slightly pubescent outside, 3-4 lobed, the lobes widely deltoid, about half as long as the calyx, ciliate; corolla nearly glabrous, about $\frac{1}{10}$ in. long, 3-4-lobed, the lobes short; stamens 14-16, all or nearly all in pairs, glabrous, the inner ones smaller; ovary rudimentary; females: calyx pubescent, glabrescent, $\frac{1}{5}$ in. long, spreading, the lobes ovate; corolla pubescent, the lobes $\frac{1}{10}$ in. long, oval; staminodes 3 or 6, linear, glabrous; ovary glabrous, at the base with a ring of hairs, 6-celled, with a solitary ovule in each cell; styles 3, "distant," glabrous; fruit globular, about $\frac{1}{3}$-$\frac{3}{4}$ in. in diameter, glabrous, smooth, and shining.—(After Hiern.)

HAB.—Tenasserim.—Fl. Jan.; Fr. Feb.

2. **M. buxifolia,** Pers.; Bedd. Sylv. Madr. 148, t. 19, f. 4.—*Mé-pyoung.*—An evergreen little tree or shrub, the young shoots sparingly appressed-pubescent; leaves variable, from obovate to elliptically oblong and oval, on a very short puberulous petiole, 1-2 in. long, rarely longer, blunt or retuse, rarely bluntish acuminate, entire, thin-coriaceous, glossy above, glabrous, the midrib beneath sharply

prominent, the net-veination rather lax; flowers small, very shortly pedicelled, 3-merous, white, the males usually by 2 or 3 and forming a very short peduncled, poor, puberulous cyme, the females yellow, solitary and almost sessile in the axils of the leaves; calyx minutely pubescent, about a line long, the lobes short, acute; corolla appressed tawny-pubescent outside, 3-cleft, the tube short, the lobes acute; stamens in females none, in the males 6; filaments much longer than the oblong anthers; ovary in males rudimentary, in the females 3-celled, with a short 3-toothed style; berry globular, the size of a large pea, smooth, yellow, edible, 1-3-seeded.

Hab.—Upper Tenasserim.—Fl. Feb.-March.

3. **M. Andamanica,** Kz.—An evergreen shrub, 3-5 ft. high, the branchlets ochraceous hirsute-tomentose; leaves elliptically to ovate-oblong, on a very short brown-tomentose petiole, 4-6 in. long, abruptly acuminate, entire, chartaceous, glabrous above, beneath on the rounded midrib and the nerves appressed tawny-hairy; female flowers 3-merous, very shortly pedicelled, solitary in the axils of the leaves; bracts minute; calyx appressed-pubescent, deeply 3-lobed, the lobes acute; corolla appressed tawny-pubescent, the tube somewhat widened, constricted under the limb, the lobes oblong, acute; berries rather dry, oblong, more than an inch long, stylose-mucronate, smooth, usually 3-seeded; seeds linear-oblong.

Hab.—Frequent in the moister upper mixed forests of the Andamans.—Fr. Apr.—s.—SS.=SiS.

STYRACEÆ.

Flowers regular, hermaphrodite, rarely polygamous. Calyx-tube more or less adnate to the ovary, or free, the limb 5- rarely 4-7-lobed, toothed or almost truncate. Corolla deeply divided into as many or twice as many lobes as there are calyx-lobes, imbricate or almost valvate in bud. Stamens usually numerous, rarely as many or twice as many as corolla-lobes, inserted in a single or more rows at the base or in the short tube of the corolla, those of the outer series usually alternating with the corolla-lobes; filaments filiform or flat; anthers 2-celled, opening in longitudinal slits, the cells either short and almost half-oval or elongate and linear. Ovary inferior or half-inferior, rarely wholly superior, 5-2-celled, the cells with 2-4, rarely a single ovule suspended from the inner axial angle or the upper ones erect; style filiform, the stigma simple or more or less capitate or 5-2-lobed. Fruit either a more or less succulent or dry drupe, containing a 5- or fewer-celled nut, or a capsule opening by valves. Seeds usually solitary, pendulous, the testa thin; albumen fleshy. Embryo straight or curved, axile, with a long radicle, the cotyledons short and flat.—Trees or shrubs,

with alternate simple leaves often turning yellowish in drying. Stipules none. Flowers usually small or middling-sized, usually in axillary spikes, racemes or clusters, rarely solitary. Bracts minute, often scale-like.

Benzoin and storax, fragrant gum-resins, are the produce of a few species of *Styrax*. Some species of *Symplocos* yield yellow or red dye. The species here described are all that are as yet known from Burma.

Anthers elongate, linear; drupe tardily opening in valves, dry . *Styrax.*
Anthers short, oval; drupe more or less succulent, crowned by the calyx-limb . . . . . *Symplocos.*

STYRAX, L.

Calyx urceolate bell-shaped, 5-toothed or truncate. Corolla usually 5- rarely 4-7-parted, the lobes twisted or rarely almost valvate in bud. Stamens twice as many as corolla-lobes, rarely varying in number from 7-12, in a single row, adnate to the base of the corolla; filaments at the base united in a short tube; anthers erect, linear to linear-oblong. Ovary quite free, or adnate at the base, 3-celled at the base, 1-celled at the apex, the cells with several ovules in 3 series, those of the upper row almost erect, the median ones horizontal, the lowermost ones suspended from a free axial placenta, the dissepiments incomplete; style simple with a capitately 3-lobed stigma. Fruit a dry drupe or rather capsule, containing a 1- (rarely 2-3-) -seeded nut, often valvately dehiscing.—Trees or shrubs, with alternate simple leaves not drying yellowish. Flowers usually conspicuous, solitary or in poor racemes or panicles, terminal or axillary.

× *All parts more or less tomentose, the under side of leaves particularly so.*
Leaves white-tomentose beneath; calyx spathaceous-slit, conspicuously subulate-toothed . . . . . *S. rugosum.*
×× *Younger parts more or less tomentose; leaves sparingly and minutely stellate-puberulous, glabrescent and green.*
Calyx 5- or 6-toothed; corolla-lobes narrow-oblong, about 4 lin. long; leaves serrulate . . . . . *S. serrulatum.*
Calyx truncate and minutely toothed; corolla-lobes ovate, nearly ¾ in. long; leaves remotely and minutely toothed . . . *S. virgatum.*

1. **S. rugosum,** Kz.—An evergreen tree, the branchlets and all younger parts covered with a rusty-coloured floccose tomentum; leaves oblong, on a strong floccose-tomentose petiole 1-2 lin. long, obtuse at the base, 1½-2½ in. long, more or less acuminate, irregularly serrate and occasionally somewhat lobed, wrinkled and shortly pubescent above, beneath softly white-tomentose; flowers middling-sized, white, on thick, curved, about a line long, floccose-tomentose

pedicels, solitary in the axils of the leaves, and forming short spurious racemes at the end of young branchlets and here supported by the young leaves; bracts several, as long as the calyx, subulate-linear and often cut, tomentose; calyx whitish-tomentose, more or less rusty-floccose on the back, usually spathe-like, splitting to near the middle, irregularly 5-toothed, the teeth linear-subulate; corolla about ¾ in. long, velvety, the lobes oblong, bluntish; filaments white-villous at the broad base.

Hab.—Martaban hills, at 4,000 ft. elevation.—Fl. May.

2. **S. serrulatum,** Roxb.—An evergreen small tree or remaining shrubby, the young shoots puberulous or tawny-tomentose from minute stellate hairs; leaves oblong to oblong-lanceolate, on a puberulous 1-2 lin. long petiole, rather acute at the base, 2-3 in. long, more or less acuminate and often almost caudately so, serrulate-toothed, chartaceous, glabrous or nearly so, green; flowers middling-sized, yellowish, on 3-4 lin. long, tomentose, drooping pedicels, usually by 2 or 3 in the axils of the leaves and at the same time forming one-sided spurious racemes at the end of the young branchlets; calyx about 2 lin. long or longer, villous-tomentose, usually 5- or 6-toothed, the teeth short and broad; corolla 5-cleft, the lobes oblong-lanceolate, velvety, nearly 4 lin. long; stamens 10; filaments villous at the dilated base; drupes capsule-like, ovoid-globular to oblong, about ½ an in. long, densely and shortly velvety, irregularly dehiscing from the base, 1-4-seeded.

Hab.—Chittagong.—Fl. March; Fr. Oct.

3. **S. virgatum,** Wall.—An evergreen tree, the young shoots more or less densely tomentose; leaves oblong or elliptically oblong, on a 1-2 lin. long pubescent petiole, 3-4 in. long, acuminate, minutely and remotely toothed, chartaceous, more or less sprinkled with minute stellate hairs and glabrescent, green; flowers conspicuous, white, on floccose-tomentose pedicels varying in length from only 4 to 5-7 lin., solitary in the axils of the leaves and spuriously racemose along the short young branchlets; calyx greyish-tomentose, glabrescent towards the limb, almost membranous, truncate with 5 or 6 minute teethlet; corolla-lobes about ½-¾ in. long, ovate, velvety or minutely puberulous; stamens 10; filaments villous at the dilated base.

Hab.—Burma, probably Ava.

Remarks.—Yields, like the preceding, gum-benjamin or benzoin of inferior quality.

SYMPLOCOS, L.

Calyx more or less adnate to the ovary, 5-lobed. Petals sometimes quite free, but usually adhering with their bases to the fila-

ments and forming a short tube, usually 5 (rarely 10, in a double row), imbricate in bud. Stamens numerous, in 1 or several rows, rarely in 5 or more bundles; filaments filiform or ligulate, united at the base; anthers oval and short. Hypogynous scales large, cushion-like and fleshy, or wanting. Ovary inferior or half-inferior, 5-2-celled, the cells usually with 2-4, rarely a single ovule, suspended from the summit of the axils; style filiform, with a simple or lobed stigma. Fruit a more or less succulent drupe crowned by the calyx-limb, containing a single 5- or fewer-celled nut. Embryo straight or curved.—Trees or shrubs, with alternate simple leaves often drying yellow. Flowers usually small, in short axillary racemes, spikes or clusters, rarely solitary. Bracts minute, often scale-like.

* *Ovary 3-celled. Drupes oblong or elliptical, 3-celled. Embryo straight.*

Glabrous; flowers sessile, in compound puberulous spikes; drupes terete . . . . . *S. lucida.*

Young shoots more or less pubescent; flowers shortly pedicelled, in simple or branched villous-tomentose racemes; drupes terete . *S. racemosa.*

Young shoots more or less rusty-pubescent; flowers sessile or nearly so, in simple tomentose spikes; drupes sulcate-ribbed . . *S. sulcata.*

Glabrous; petioles and rib beneath sparingly hairy; racemes quite glabrous, slender; drupes terete . . . . . *S. leiostachya.*

* * *Ovary 2- rarely 3-celled. Drupes ovoid with a contracted apex, or turbinate, by abortion usually 1-seeded, the mass of the endocarp often protruding inwards so as to cause the seed turning more or less horse-shoe-shaped. Embryo curved.*

○ *Flowers sessile, in simple or compound spikes; stamens in 2 or more series.*

Young shoots, spikes and leaves beneath more or less rusty-pubescent or tomentose; drupes turbinate, ribbed . . . . *S. Javanica.*

Glabrous; drupes turbinate, torulose-ribbed; spikes glabrous . *S. spicata.*

Glabrous; drupes ovoid-turbinate, terete; spikes glabrous . . *S. polycarpa.*

○ ○ *Flowers pedicelled, in simple or compound racemes; stamens in 2 or more series.*

Glabrous; drupes ovoid-turbinate, terete; racemes compound, minutely appressed-pubescent, robust . . . . . *S. pedicellata.*

Glabrous; leaves caudate-acuminate; drupes ovoid-turbinate, terete; racemes simple, slender, pubescent . . . . *S. caudata.*

○ ○ ○ *Flowers white, pedicelled, in racemes or poor panicles. Stamens collected in 5 bundles.*

Racemes appressed-pubescent, forming slender panicles at the end of the young pubescent branchlets; pedicels long, filiform . *S. cratægoides.*

Racemes short, shortly tomentose; pedicels very short and thick . *S. leucantha.*

* *Ovary 3-celled; drupes oblong or elliptical, 3-celled; embryo straight.*

1. **S. lucida,** Wall.—An evergreen small stunted tree, all parts quite glabrous; leaves lanceolate to elliptically lanceolate, on a 4-6 lin. long petiole, 3-4 in. long, shortly acuminate, almost entire, or more or less serrulate, coriaceous, shining above, glabrous, laxly

veined and minutely net-veined between the nerves; flowers small, but much larger than in *S. spicata*, yellow, sessile, forming short, puberulous, compound spikes in the axils of the leaves; bracts and bractlets 3 under each flower, ovate, ciliate, somewhat acute, calyx-like; calyx glabrous, 5-lobed, the lobes rather short, rotundate, blunt, minutely ciliate; petals nearly 1½ lin. long, oblong, almost blunt; stamens numerous, in several rows, free to the base; ovary glabrous, 3-celled; drupes elliptical, about 5-6 lin. long, terete, smooth, containing a hard, bony, 3-celled nut; embryo straight.

Hab.—Frequent in the drier hill forests of Martaban, at 5,000 to 7,000 ft. elevation.—Fl. March.—l.—SS.=Metam.

2. **S. racemosa,** Roxb. Brand. For. Fl. 300.—An evergreen tree (20—25 + (?) + 1—1½), the young shoots more or less pubescent; leaves oblong and obovate-lanceolate to lanceolate, tapering in a 3-4 lin. long, strong, often pubescent petiole, 3-6 in. long, bluntish acuminate or apiculate, more or less serrulate, coriaceous, glabrous or appressed-pubescent on the midrib beneath, in drying turning yellowish, the nerves strong, the veination lax; flowers small, yellowish, on short, strong, villous pedicels forming a simple or branched villous-tomentose strong raceme in the axils of the leaves and shorter than them; bract at the base of the pedicel ovate to obovate, about a line long, villous-pubescent, the 2 bractlets much smaller; calyx glabrous, deeply 5-lobed, the lobes about a line long, ovate, acute or nearly blunt; petals nearly 3 lin. long, rotate, oval, blunt; stamens nearly as long as the petals, unequal, numerous, the filaments filiform, inserted at the base; ovary 3-celled; drupes elliptically oblong, about 4-5 lin. long, crowned by the calyx-limb, glabrous, terete or very slightly 3-lobed, 3-celled, and 3- or by abortion 2-1-seeded, when fully ripe bluish-black; embryo straight.

Hab.—Frequent in the open and dry forests, from Prome and Martaban down to Pegu and Tenasserim, up to 2,000 ft. elevation; also Andamans.—Fl. Jan.-Feb.—l.—SS.=Metam. Lat. Argyll.

Remarks.—Wood yellowish, strong and compact. Used for furniture. Bark yields a red dye.

3. **S. leiostachya,** Kz.—An evergreen tree or shrub (?), the branchlets sprinkled with a few dark-coloured stiff hairs, the leaf-buds glabrous; leaves elliptically lanceolate or oblong-lanceolate, on a sparingly hairy petiole 3-4 lin. long, 2-4 in. long, acuminate, repand-serrate, almost chartaceous, shining above, beneath on the strong midrib and nerves sparingly appressed-pubescent, remaining green or drying brownish, the veination thin and inconspicuous; flowers small, on slender 1-1½ lin. long glabrous pedicels, forming numerous slender, glabrous, simple racemes at the end of the branches or solitary in the axils of the leaves and somewhat shorter than them;

bracts about a line long, lanceolate, acute, quite glabrous; bractlets almost conform, but minute; calyx smooth, the lobes ovate, blunt, about $\frac{2}{3}$ lin. long; corolla rotate, the lobes ovate-oblong, blunt, about $1\frac{1}{2}$ lin. long; stamens numerous, unequal, inserted at the base of the very short tube; berries ovoid-oblong, terete, smooth, 4 lin. long, crowned by the rather conspicuous calyx-limb.

4. **S. sulcata,** Kz.—An evergreen small often stunted tree, 15-25 ft. high, the young shoots covered with a rusty-coloured or tawny appressed pubescence; leaves lanceolate to elliptically lanceolate, acute at the base, on a strong petiole 3-4 lin. long, acuminate, more or less crenate-serrulate or entire, thick chartaceous, 5-7 in. long, more or less glossy above, and when old also beneath, glabrous, the nerves strong, the net-veination conspicuous and not very lax; flowers small, yellow, almost sessile, in short, simple, rusty-tomentose axillary racemes; bracts and bractlets almost equal, obovate-lanceolate, acute, appressed-pubescent, nearly a line long; calyx densely appressed-pubescent, the lobes about a line long, ovate-lanceolate, rather blunt; petals 2 lin. long, ovate-oblong, blunt; stamens numerous, unequal, inserted at the base; drupes elliptically oblong, on $\frac{1}{3}$ lin. long tomentose peduncles, about 4-5 lin. long, sulcate, almost glabrous, when fully ripe bluish black, crowned by the calyx-limb, containing a sulcate, hard, bony, 3-celled nut; embryo straight.

Var. 1, **glabrior:** leaves more coriaceous, quite glabrous, shining above; drupes larger and glabrous.

Var. 2, **pubescens:** leaves narrower and longer acuminate, less glossy or almost opaque, pubescent on the midrib beneath; the young shoots rusty villous-tomentose; drupes (unripe) pubescent.

HAB.—Frequent in the drier hill forests of Martaban, at 3,000 to 6,000 ft. elevation; var. 2: Upper Tenasserim, at 4,000 ft. elevation..—Fr. March.—l.—SS.=Metam.

** *Ovary* 2- *rarely* 3-*celled; drupes ovoid, contracted at the apex, or turbinate, usually* 1-*seeded; embryo curved.*

5. **S. Javanica,** Kz.—An evergreen small tree, all softer parts more or less covered with a soft rusty-coloured pubescence; leaves from lanceolate to elliptically and oblong-lanceolate, usually at both ends acuminate, on a thick, densely rusty-tomentose petiole $\frac{1}{2}$-$\frac{3}{4}$ in. long, more or less acuminate, 5-8 in. long, serrulate, rigidly pergamaceous, smooth and more or less opaque above, beneath more or less softly pubescent from short rusty-coloured hairs, the nerves rather crowded and more or less parallel, the net-veination rather faint; flowers white, sessile, rather small, forming shorter or longer, robust, densely tawny- or rusty-villous tomentose, branched

or rarely simple racemes in the axils of the leaves and shorter than them; bract and bractlets calyx-like, broadly ovate, rather acute, densely rusty-pubescent, about a line long, the bract a little longer; calyx deeply 5-lobed, rusty-pubescent, the lobes oblong, about a line long; corolla rotate, the lobes ovate-oblong, acute; stamens numerous, the inner series shorter, inserted at the base of the short tube; drupes ovoid, nearly 3 lin. long, appressed-pubescent, glabrescent, sulcate-ribbed, crowned by the large calyx-limb, containing a 1-seeded nut; embryo curved.

Hab.—Tenasserim.

6. **S. spicata,** Roxb.; Bedd. Sylv. Madr. 149; Brand. For. Fl. 300.—An evergreen middling-sized tree, all parts quite glabrous; leaves from lanceolate to oblong and almost obovate-lanceolate, tapering in a 4-6 lin. long petiole, 3-5 in. long, acuminate, crenate-toothed or almost entire, coriaceous, glabrous, shining above, in a dried state more or less yellowish, the veination between the nerves conspicuous, but thin and lax; flowers yellowish, small, almost sessile, forming more or less branched glabrous spikes in the axils of the leaves and shorter than them; bract and bractlets rotundate, concave and ciliate, calyx-like; calyx glabrous, 5-parted, the lobes broadly oblong, blunt, smooth, about ½ a line long; petals oblong, nearly a line long; stamens numerous, long-exserted, in apparently a single row and free to the base; ovary 3-celled, glabrous; drupes the size of a pea, turbinate, torulose-ribbed, olive-coloured, containing a conformly-shaped thick and hard 1-seeded nut; embryo curved.

Hab.—Tenasserim, apparently frequent.—Fl. Aug.

7. **S. polycarpa,** Wall.—An evergreen small stunted tree, all parts quite glabrous; leaves lanceolate to obovate-lanceolate, on a 4-6 lin. long petiole, 2-5 in. long, more or less acuminate, obsoletely crenate-serrulate, coriaceous, glabrous, almost opaque, in drying turning yellowish, beneath almost glaucous-green, the veination between the nerves thin and lax and almost without net-veination; flowers small, yellow, sessile or nearly so, forming glabrous, simple, or at the base branched spikes in the axils of the leaves and shorter than them; bract and bractlets conform, the former at the base of the very short pedicel or forming with the bractlets a calyx-like involucre, broadly ovate, somewhat acute; calyx glabrous, the lobes very short and broad, rounded; petals about a line long, blunt; stamens numerous, unequal, the filaments free to their insertion; ovary glabrous, 2-celled (?); drupes ovoid-turbinate, terete, the size of a small pea, smooth, crowned by the broad calyx-limb, containing a pergamaceous, thin, 1-seeded nut.

Hab.—Not unfrequent in the drier hill forests of Martaban and Tenasserim, at 4,000 to 5,000 ft. elevation.—Fl. Feb.-Aug.—l.—SS.=Metam.

8. **S. pedicellata,** Kz.—An evergreen tree (30—40 + 10—15 + 3—4), the young shoots very slender and sparingly appressed silk-hairy; bark about 2 lin. thick, brownish grey, obsoletely fissured; cut greenish; leaves elliptically lanceolate to lanceolate, tapering in a slender, glabrous petiole 4-5 lin. long, 4-5 in. long, almost caudate-acuminate, obsoletely crenate-serrulate, thin pergamaceous, glabrous, opaque, the nerves and the lax veination thin and little conspicuous; racemes slender, compound, and forming poor, almost sessile, minutely appressed, pubescent panicles in the axils of the leaves and above the scars of the fallen ones; bractlets hardly ⅓ lin. long, ovate, acute, glabrous, deciduous; pedicels usually 2 lin. long, minutely appressed-pubescent; unripe berries ovoid, 3-4 lin. long, terete and smooth, crowned by the calyx-limb, containing a pergamaceous 1-seeded nut; calyx-lobes in fruit broadly ovate, blunt, about ⅓ lin. long, glabrous.

Hab.—Rather rare in the tropical forests of Martaban, east of Tounghoo.—Fr. Apr.—s.—SS.=Metam.

Remarks.—Wood very pale brown, rather light, close-grained, soft.

9. **S. caudata,** Wall.—An evergreen tree, all parts glabrous or nearly so; leaves lanceolate to ovate-lanceolate, on a 3-4 lin. long petiole, acute at the base, 2-4 in. long, long and caudate-acuminate, crenate-serrulate, thin-coriaceous, in a dried state more or less yellowish, quite glabrous, more or less opaque, the nerves and the lax net-veination thin; flowers small, yellow, on slender 2 to nearly 3 lin. long puberulous pedicels, forming short, slender, pubescent racemes in the axils of the leaves and shorter than them; bracts and bractlets obovate-lanceolate, pubescent, very deciduous; calyx glabrous, the lobes about ⅔ lin. long, ovate-lanceolate; corolla rotate, the lobes about 3 times longer than the calyx-lobes, oblong, blunt; stamens numerous, unequal, inserted at the base of the very short corolla-tube; drupes ovoid, narrowed at the top, the size of a pea, smooth and glossy, crowned by the broad calyx-limb, containing a pergamaceous 2-celled but only 1-seeded nut; embryo curved.

Hab.—Upper Tenasserim; Chittagong.—Fr. Apr.

10. **S. cratægoides,** D. Don.; Brand. For. Fl. 299.—An evergreen (?) small stunted tree, the young shoots more or less appressed-pubescent; leaves obovate-oblong to oblong, on a 2-3 lin. long, thin, sparingly hairy petiole, obtuse at the base, 1-2½ in. long, shortly acuminate or acute, rather sharply serrulate, chartaceous, glabrous (or the midrib beneath pubescent), turning yellowish in drying, rather opaque, the nerves and the lax veination in adult

leaves rather conspicuous and strong; flowers rather small, yellowish, then white, fragrant, on 1-2 lin. long pedicels, forming short appressed-pubescent racemes in the axils of the younger leaves and towards the end of the young branchlets, usually collected into terminal leafy or leafless panicles; bracts and bractlets linear, very deciduous; calyx glabrous or nearly so, the limb broad, deeply 5-lobed, the lobes broadly oblong, blunt, ciliate, ½ a lin. long; corolla rotate, the lobes oblong, blunt, nearly 2 lin. long; stamens numerous, collected in 5 bundles adnate to the base of the very short corolla-tube; drupes the size of a pepper-kernel, obliquely ovoid, containing a thin, 2-celled, but only 1-seeded nut; embryo curved.

Hab.—Martaban hills east of Tounghoo.

11. **S. leucantha**, Kz.—*Tha-lè.*—An evergreen tree (20—25+(?) +¾—1), all parts glabrous; leaves oblong- to elliptically-lanceolate, a little unequal at the base, on a slender 2-3 lin. long petiole, 3-4 in. long, shortly and bluntish acuminate, crenulate-toothed, chartaceous, glabrous; flowers white, fragrant, jointed on the very short (hardly ⅓ lin. long), thick, greyish tomentose pedicels, forming short tomentose racemes in the axils of the leaves; bracts ovate, pubescent outside, deciduous; calyx quite glabrous, or the ovate blunt ciliolate about 2 lin. long lobes a little pubescent outside; petals obovate-oblong, twice as long as the calyx-lobes; stamens glabrous, unequal, in 5 bundles, each inserted at the base of the corolla-lobes; ovary and the long style sparingly hairy.

Hab.—Frequent in the swamp forests of the Irrawaddi plains.—Fl. Jan.—s.—SS.=All.

JASMINEÆ.

Flowers regular, hermaphrodite or unisexual. Calyx free, usually small, 4- or 5- rarely more-toothed or -lobed, or rarely truncate and entire. Corolla with a longer or shorter tube, 4- or 5- rarely more-lobed, or divided to the base into 4 petals, rarely 2-petalled or wanting altogether. Stamens 2, rarely 4, adhering to the base of the corolla; filaments usually short; anthers 2-celled, the cells opening in longitudinal slits. Ovary 2-celled, the cells with 2, rarely 1 or 3 ovules, in the young state attached laterally, but becoming pendulous or ascending according to the growth of the ovary. Fruit succulent or capsular, entire or 2-lobed, 2-celled or reduced to a single cell and seed. Seeds with or without albumen. Embryo straight.—Trees or shrubs, often climbing, very rarely herbs, with opposite or very rarely alternate, simple, or pinnate leaves. Flowers in axillary or terminal panicles, sometimes reduced to short racemes or clusters.

About 24 species of this family grow in Burma, most of which are climbers. The timber of several species is durable and close-grained. The genuine oil of jasmine is obtained from *Jasminum officinale* and *J. grandiflorum*. The common olive (*Olea Europæa*) yields the well-known olive-oil. Manna excretes from the bark of several species of *Fraxinus*. The corollas of *Nyctanthes* are used as an orange dye. Many of the *Jasmineæ* scent the air, especially during night, with their delicious perfume.

* *Stamens* 2 *only.*
○ Corolla-limb 5-12-lobed, usually twisted-imbricate in bud. Ovules erect.
× Fruit a fleshy 1- or 2-lobed drupe.
Corolla twisted in bud; albumen none; usually climbers . . *Jasminum.*
× × Fruit a dry compressed capsule.
Corolla twisted in bud; albumen none; erect trees . . . *Nyctanthes.*
○ ○ Corolla 4-lobed, rarely 6-8-cleft or wanting, with or without a tube; ovules pendulous.
× Fruit a dry 2- valved capsule; corolla-lobes twisted in bud.
Ovary 2-celled, the cells 4-ovuled; seeds winged; albumen none; trees, with usually pinnate leaves . . . . . *Schrebera.*
× × Fruit a drupe or berry; corolla valvate or nearly so in bud.
† Ovules solitary; ovary 2-celled; a climber, with sharply 4-cornered stems . . . . *Myxopyrum.*
†† Ovules 2 in each cell; ovary 2-celled; erect trees or shrubs.
Albumen none . . . . . *Chionanthus.*
Seeds albuminous; flowers in axillary or terminal panicles . . *Olea.*
* * *Stamens* 4, *alternating with the* 4 *petals.*
Corolla without tube; ovules erect; climber . . . . . *Azima.*

JASMINUM, L.

Corolla-tube cylindrical, the limb spreading, 5-8-lobed, imbricate-twisted in bud. Stamens 2, included. Ovary entire or notched, 2-celled, the cells with a solitary or rarely 2 or 3 ovules attached laterally, but becoming erect as the ovary enlarges; styles terminal or in the notch, very shortly 2-lobed. Berry almost to the base 2-lobed or one of the lobes abortive. Seeds usually solitary in each lobe, erect. Albumen none. Cotyledons thick and fleshy, radicle scarcely prominent.—Shrubs, usually climbing, with opposite or rarely alternate leaves either 1-foliolate or pinnately 3-foliolate or pinnate. Flowers in axillary or terminal trichotomous panicles or rarely almost solitary or clustered. Bracts often very small, rarely large and often discoloured.

* *Leaves pinnate or pinnately* 3-*foliolate, rarely the one or other* 1-*foliolate.*
Glabrous; leaves unpaired-pinnate; calyx-lobes subulate, about 3-4 lin. long . . . . . *J. grandiflorum.*
* * *Leaves* 1-*foliolate, with a jointed petiole.*

× *Bracts minute or very short and filiform, rarely wanting altogether.*

\+ Calyx-lobes short or the calyx almost truncate.

† Flowers in corymbs.

Glabrous; pedicels 2-5 lin. long; calyx 5-cornered, almost truncate *J. extensum.*

Pubescent; flowers sessile; calyx-teeth as long as the calyx-tube . *J. decussatum.*

†† Flowers in poor axillary racemes; pedicels ½-1 in. long; calyx-teeth distinct.

§ Corolla-lobes blunt, glabrous.

Nerves conspicuous on both sides, usually with a gland in the axils; corolla-lobes usually 8, rarely 5-7 . . . . . *J. subglandulosum.*

Nerves thin and obsolete, without glands; corolla-lobes usually 5 . *J. attenuatum.*

§ § Corolla-lobes acuminate.

Glabrous; leaves more or less narrow, very long acuminate; corolla-lobes 9-12 . . . . . *J laurifolium.*

\+ + Calyx-lobes longer than the calyx-tube, subulate.

Small shrub, almost erect; branchlets puberulous; leaves penni-nerved . . . . . *J. sambac.*

Twining, glabrous; leaves 3-nerved . . . . . *J. anastomosans.*

× × *Bracts leafy, conspicuous, shorter or longer than the calyx.*

\+ Bracts longer than the calyx, leafy, white, discoloured.

More or less pubescent, especially the branchlets; corolla-tube about ½ in. long or longer . . . . . *J. Rottlerianum.*

Glabrous when adult, with a tuft of hairs in the nerve-axils beneath; corolla-tube about an in. long . . . . . *J. coarctatum.*

\+ + Bracts shorter than the calyx; calyx-lobes subulate; pedicels 1-2 lin. long.

More or less pubescent; corolla and calyx-lobes each 6-9, the latter 4-5 lin. long, pubescent . . . . . *J. hirsutum.*

Glabrous or puberulous; corolla-and calyx-lobes each 6-7, the latter only a line long, more or less pubescent . . . . . *J. scandens.*

* *Leaves pinnate or pinnately* 3*-foliolate.*

1. **J. grandiflorum**, L.—*Myat-lay.*—An evergreen scandent shrub, all parts glabrous; leaves unpaired-pinnate, on a short petiole; leaflets in 3 to 1 pair with an odd one (the upper pair often confluent with the terminal leaflet), on very short petiolules or sessile, more or less rhomboid-ovate, unequal at the base, ½-1 in. long, blunt or acute, membranous, glabrous; flowers white, often reddish outside, on slender pedicels, forming a poor corymbose glabrous panicle in the axils of the leaves; calyx glabrous, 5-lobed, the lobes subulate, about 3 lin. long; corolla-tube slender, ½ in. long, the lobes oval, blunt; berry-lobes usually solitary, ovoid, glossy, smooth.

Hab.—Burma (according to Dr. Mason).

* * *Leaves* 1*-foliolate.*

× *Bracts minute or short and filiform, rarely wanting altogether.*

2. **J. extensum**, Wall.—An evergreen scandent shrub with terete or slightly 4-gonous branchlets, all parts glabrous; leaves

lanceolate to ovate-lanceolate, on a 3-4 lin. long, slender petiole jointed at the apex, acute or acuminate at the base, 2-3 in. long, bluntish acuminate with a mucro, entire, membranous, glabrous, penninerved; flowers small, white, on 2-5 lin. long at the middle 2-bracted pedicels, forming a glabrous brachiate shorter- or longer-peduncled poor corymb in the axils of the upper leaves and at the end of the branchlets; calyx glabrous, bell-shaped, about a line long, 5-cornered with the angles produced into as many minute teeth; corolla-tube $\frac{2}{3}$ in. long, slender, the limb about $\frac{1}{3}$ that length, usually 6-lobed, the lobes lanceolate, acute; berry-lobes globular-ovoid, the size of a small pea, blackish, glossy.

HAB.—Ava.—Fl. Fr. Nov.

3. **J. decussatum,** Wall.—An evergreen scandent shrub, all parts densely pubescent; leaves ovate- to oblong-lanceolate, on a 2-3 lin. long, villous petiole jointed at the base, rounded at the base, 2-3 in. long, acuminate, membranous, entire, penninerved, on both sides softly (beneath often villously) pubescent; flowers small, white, sessile or nearly so, forming a longer or shorter peduncled small corymb-like pubescent panicle in the axils of the leaves and at the end of the branchlets; bracts linear, acuminate, pubescent; calyx pubescent, small, 6-toothed, the teeth linear-lanceolate, about as long or shorter or somewhat longer than the calyx-tube; corolla-tube about $\frac{1}{2}$ in. long, the lobes linear-lanceolate, acute, about half as long as the tube; berry-lobes solitary or paired, ovoid-oblong, nearly $\frac{1}{2}$ an in. long, fleshy, smooth, bluish black.

HAB.—Not unfrequent in the tropical forests, from Martaban down to Upper Tenasserim, up to 3,000 ft. elevation.—Fl. Febr.; Fr. March.—SS.=Metam.

4. **J. subglandulosum,** Kz.—An evergreen shrub, with scandent terete branches, all parts glabrous; leaves oblong to obovate-oblong, rounded at the somewhat narrowed base, 4-5 in. long, shortly acuminate, entire, thin-coriaceous, glossy, glabrous, the nerves on both sides (especially beneath) conspicuous, and usually with a gland in their axils; flowers white, on $\frac{1}{2}$-1 in. long, slender pedicels thickened upwards, forming a peduncled, very lax, glabrous, nude raceme in the axils of the leaves; bractlets minute, subulate; calyx glabrous, the teeth broad, very short, blunt; corolla-tube $\frac{1}{2}$-$\frac{2}{3}$ in. long, the limb half as long, 6-8- (usually 8) -lobed, the lobes obovate-oblong, blunt; berry-lobes ovoid-oblong, diverging.

HAB.—Not unfrequent in the tropical forests of the southern slopes of the Pegu Yomah above Rangoon; also Tenasserim.—Fl. Dec.—s.—SS.=Lat. p.

5. **J. attenuatum,** Wall.—An evergreen scandent shrub, all parts glabrous; leaves oblong to oblong-lanceolate, obtuse at the base, on a strong petiole $\frac{1}{2}$-$\frac{3}{4}$ in. long, 4-6 in. long, bluntish acu-

minate, entire, coriaceous, glabrous, the nerves thin and inconspicuous, without glands in the axils ; flowers white, on ½ in. long strong pedicels, forming a peduncled, glabrous, naked, lax raceme in the axils of the leaves ; bractlets linear-subulate, small ; calyx glabrous, the teeth very short, acute ; corolla-tube about ½-¾ in. long, the limb nearly as long, usually 5-lobed, the lobes linear-oblong, blunt ; berry-lobes ovoid, very diverging.

Hab.—Not unfrequent in the damp hill forests of the Martaban hills, at 5,000 to 7,000 ft. elevation.—Fl. Fr. March.—s.—SS.=Metam.

6. **J. laurifolium,** Roxb.—An evergreen scandent shrub, up to 8 ft. high, with terete branchlets, all parts quite glabrous ; leaves linear to linear-lanceolate, rounded or acute at the base, on a 2 lin. long petiole jointed at the middle, 2-5 in. long, bristly acuminate, entire, glabrous, thinly coriaceous, the lateral nerves thin and uniting from the base into a more or less distinct intramarginal nerve and without any net-veination between them ; flowers middling-sized, white, often reddish outside, on about an inch long, slender, glabrous pedicels, arising by 2-5 at the end of the branchlets or from the axils of the upper leaves, or forming 3-flowered peduncled racemes ; calyx glabrous, the tube about a line long, 6-12-lobed, the lobes long or short, linear-subulate ; corolla-tube about ¾ in. long, the limb about as long, 9-12-lobed, the lobes linear-lanceolate, acuminate ; berry-lobes 2 or 1, ovoid-oblong, about ⅓ in. long, sappy, glossy, blackish.

Var. 1, **laurifolium proper :** calyx-lobes much longer than the calyx-tube, up to 4 lin. long.

Var. 2, **brachylobum :** calyx-lobes as long or a little longer than the calyx-tube, more or less recurved.

Hab.—Var. 2 : frequent in the tropical forests from Martaban down to Tenasserim.—Fl. Feb.-Apr. ; Fr. Apr.-May.—s.—SS.=Metam.

7. **J. anastomosans,** Wall.—An evergreen scandent shrub, 3-5 ft. high, with terete branchlets, all parts glabrous ; leaves ovate to ovate-oblong, on a 2-3 lin. long petiole jointed at the middle, rounded or obtuse at the base, 1-3 in. long, acuminate, entire, chartaceous, glabrous, 3-nerved from the base, the lateral nerves all anastomosing, veined and obsoletely and laxly net-veined between ; flowers white, on very short bracteoled hardly a line long pedicels, solitary or by pairs from the axils of the leaves or forming very short 3- or 4-flowered axillary clusters ; calyx glabrous, 6-cleft, the lobes linear-subulate, up to 4 lin. long ; corolla-tube about ⅔ in. long, the limb usually 7-cleft, the linear lobes almost as long as the tube.

Hab.—Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and Martaban down to Tenasserim.—Fl. March-Apr.—s.—SS.=Metam. SiS.

8. **J. sambac,** Ait.; Brand. For. Fl. 311.—*Sa-pai* or *ma-lee.*—An evergreen small shrub, erect, or the terete branches somewhat scandent, the young shoots shortly pubescent; leaves oblong to ovate, on a curved, jointed petiole 1-2 lin. long, more or less rounded or almost cordate at the base, 2-3 in. long, bluntish or shortly apiculate with a mucro, entire, thin-chartaceous, while young herbaceous with a tuft of hairs in the axils of the nerves, penninerved; flowers middling-sized, fragrant, white, often reddish outside, on 1-2 lin. long slightly pubescent pedicels, forming a terminal, poor, short, slightly puberulous raceme; bracts and bractlets subulate-filiform, often deciduous; calyx puberulous or glabrous or nearly so, about 8-cleft, the lobes puberulous, subulate, somewhat longer than the calyx-tube; corolla-limb about an inch in diameter, with as many oblong to elliptical, acute or blunt lobes as there are calyx-lobes, the tube about as long as the calyx-lobes; berry-lobes 2 or 1, globular-ovoid, shorter than the calyx-lobes, black, sappy.

Hab.—Apparently not wild in Burma, but frequently cultivated by natives and often met with in neglected lands and deserted toungyas.—Fl. March-Apr.

×× *Bracts conspicuous, leafy, shorter or longer than the calyx.*

9. **J. Rottlerianum,** Wall.—An evergreen scandent shrub, the terete branchlets densely tawny pubescent; leaves oblong to ovate-lanceolate, on a tawny-villous 2-3 lin. long petiole jointed at the middle, rounded or almost cordate at the base, 3-5 in. long, shortly acuminate, entire, chartaceous, while young on both sides shortly and softly puberulous, and the nerves pubescent, adult turning more or less glabrous above, penninerved; flowers white, almost sessile, in terminal bracted puberulous or pubescent short-peduncled corymbs at the end of the branchlets; bracts ovate to ovate-lanceolate, acuminate, puberulous, white; calyx pubescent, 5-7-cleft, the lobes subulate, about 3 lin. long, pubescent; corolla-tube more than ½ in. long, the limb ½-⅓ the length of the tube, 5-7-lobed, the lobes obovate-lanceolate to ovate, acute.

Hab.—Not unfrequent in the tropical forests along the eastern slopes of the Pegu Yomah.—Fl. Apr.—s.—SS.=SiS.

10. **J. coarctatum,** Roxb.—An evergreen, large, scandent shrub, the young terete branches sparingly pubescent; leaves oblong to oblong-lanceolate, obtuse or acute at the base, on a 3-4 lin. long puberulous petiole jointed at the middle, 5-6 in. long, shortly acuminate, entire, thin-chartaceous, glossy on both sides, with a tuft of hairs in the nerve-axils beneath, penninerved; flowers white, on very short puberulous pedicels or almost sessile, forming a longer or shorter peduncled bracted puberulous corymb at the end of the branches and in the axils of the upper leaves; bracts leafy, ovate-lanceolate to linear-lanceolate, acuminate, slightly puberulous, white;

calyx more or less pubescent, usually 8-lobed, the lobes linear-subulate, somewhat longer than the tube ; corolla-tube slender, nearly an inch long, the limb 8-lobed, the lobes linear-oblong, about 4 lin. long.

Hab.—Frequent in the tropical forests along the eastern slopes of the Pegu Yomah and the Martaban hills east of Tounghoo; also Chittagong.—Fl. Apr.-May.—s.—SS.=SiS. Metam.

11. **J. hirsutum,** Willd.; Brand. For. Fl. 312.—An evergreen scandent shrub, the terete branchlets densely tawny-pubescent; leaves ovate to cordate-ovate, on a 2-3 lin. long tawny-pubescent petiole jointed at the base, rounded or cordate at the base, 1-2½ in. long, shortly acuminate to blunt with a mucro, entire, chartaceous, especially while young pubescent or puberulous beneath, often turning more or less glabrescent except on the nerves beneath ; flowers white, middling-sized, on short up to a line long pubescent pedicels, forming almost sessile or shortly peduncled, tawny-pubescent, leafy-bracted, abbreviate racemes at the end of the branchlets or on young axillary shoots; bracts leafy, lanceolate, shorter than the calyx; calyx pubescent, 6-9-cleft, the lobes subulate, pubescent, 4-5 lin. long; corolla-tube longer or nearly twice as long as the calyx-lobes, the limb of the length of the tube, 6-9-lobed, the lobes linear-oblong, acuminate.

Hab.—Ava; Pegu.—Fl. Jan.

12. **J. scandens,** Vhl.—*Tau-sa-pai.*—An evergreen, large, scandent shrub ascending up to 40 and 50 ft. high with cylindrical trunk as thick as a man's arm, very variable in its indumentum, the terete branchlets almost glabrous to densely tawny-pubescent; bark about a line thick, rather even, but rough, longitudinally corky-cracked; cut dry, pale-coloured; leaves from ovate-lanceolate to lanceolate and ovate, on a 3 to 4 lin. long pubescent or glabrous petiole jointed below the middle, more or less rounded or almost cordate at the base, 2-3 in. long, acuminate, entire, chartaceous, more or less glabrous or slightly puberulous or pubescent on the nerves, penninerved; flowers white, on thick puberulous pedicels less than a line long, forming short-peduncled pubescent or puberulous usually 3-flowered corymbs in the axils of the leaves, or the corymbs augmented by two lateral 1- or 2-flowered peduncles or collected in a spurious panicle at the end of the branchlets; bracts or rather floral leaves 2 only at the base of the inflorescence; calyx about a line long, more or less pubescent, the teeth linear, of the length of the calyx-tube; corolla-tube about ½ an in. long or longer, the limb more than half the length of the tube, 6- or 7-lobed, the lobes oblong to linear, rather blunt or acute; berry-lobes ovoid, the size of a pea, smooth, blackish.

Var. 1, **scandens proper:** all parts, especially the branchlets and leaves, more glabrous.

Var. 2, **lætum** (*J. lætum*, Wall.): the branchlets, the nerves, and sometimes the under-surface of the leaves, puberulous.

Hab.—Frequent in the tropical and open forests all over Burma from Arracan, Pegu, and Martaban down to Tenasserim.—Fl. Dec.-Feb; Fr. Apr.-May.—s : l.—SS.=∞.

Remarks.—Wood light brown.

NYCTANTHES, Juss.

Calyx tubular, entire, or obscurely 5-6-toothed. Corolla salver-shaped, the tube terete; limb 5-7-lobed, sinistrorsely twisted in bud. Anthers 2, sessile at the throat of the corolla. Ovary 2-celled, compressed, with a solitary erect ovule in each cell; style filiform, with a capitate stigma. Capsule compressed-obovate, notched, 2-celled and opening in 2 valves. Albumen none.—Trees or shrubs, with rough, simple, opposite leaves. Flowers in small terminal corymbs.

1. **N. arbor tristis, L.**; Bedd. Sylv. Madr., t. 240; Brand. For. Fl. 314.—*Hseit-bee-loo.*—A large shrub, often growing out into a small tree of 15 to 20 ft. in height, all parts more or less roughish puberulous, the branchlets 4-cornered; leaves ovate to oblong-ovate, rounded to acute at the 3- or 5-nerved base, on a 1-3 lin. long scabrous petiole, 2-4 in. long, acuminate, entire or often produced into several acute lobes, chartaceous, very scabrous above, less so beneath; flowers rather small, very fragrant, opening during night, sessile, each supported by 2 broadly ovate bracts almost concealing the calyx, by threes in peduncled small corymbs often arranged into a brachiate compound one at the end of the branchlets; corolla white, with an orange tube; capsule rigidly coriaceous, obovate, compressed, truncate or notched with a mucro, strongly longitudinally-veined, about ½ an in. long, glabrous.

Hab.—Rare in the low forests of Pegu above Rangoon; also Ava; Tenasserim.—Fl. Fr. C.S.—l.—SS.=CaS. Lat.

SCHREBERA, Roxb.

Calyx tubular-bell-shaped, very shortly 5-8-toothed, sometimes almost 2-lipped, with the lobes 2- and 3-lobed. Corolla salver-shaped, naked or pilose at the throat, the limb 6-8-cleft, twisted in bud. Stamens 2, inserted in the tube or at the throat of the corolla; filaments short; anthers 2-celled. Ovary 2-celled, with 4 pendulous ovules in each cell; style filiform with a thick shortly 2-lobed or 2-cleft stigma. Capsule woody or coriaceous, opening

into 2 valves bearing the septa in the middle. Seeds compressed, at the apex extended in a wing. Albumen none or very scanty. Embryo straight with a blunt superior radicle and leafy large cotyledons.—Trees, with unpaired-pinnate or 1-foliolate leaves. Flowers in terminal corymb-like panicles.

1. **Sch. swietenioides,** Roxb.; Bedd. Sylv. Madr., t. 248; Brand. For. Fl. 305.—*Thit-hswè-lwè.*—A tree (40—60+10—30+3—5), shedding leaves in H.S., all parts glabrous; bark about ½ an in. thick, grey, rough, peeling off in small irregular flakes; cut pale-coloured; leaves unpaired-pinnate, the petiole compressed half-terete; leaflets opposite or nearly so, in 2 or 3 pairs with an odd one, ovate to oblong, often unequal at the base and tapering in a 2-4 lin. long petiole, 2-5 in. long, bluntish acuminate, entire, chartaceous, glabrous, impressed net-veined between the thin curved nerves; flowers yellowish green, turning brownish, appearing with the young leaves, on 1-2 lin. long pedicels, arranged in peduncled corymbs forming a glabrous peduncled panicle at the end of the branchlets; calyx glabrous or rarely puberulous; corolla glabrous, naked at the throat, the tube about 3 lin. long, the lobes obovate, truncate; capsules woody, obovate pear-shaped, 1½-2 in. long, rounded at the apex, the valves with usually 4 large spongy seeds winged at the apex.

Hab.—Not unfrequent in the mixed forests all over Pegu and Martaban.—Fl. Apr.; Fr. January.—l.—SS.=SiS. All.

Remarks.—Wood grey or brown, very close-grained, heavy, hard and durable. Supposed not to warp or bend.

OLEA, Tournef.

Calyx short, bell-shaped, 4-toothed or rarely truncate. Corolla more or less funnel-shaped or spreading, the tube shorter or longer, the limb 4-parted, rarely the corolla wanting. Stamens 2, inserted in the corolla-tube if present, or hypogynous in the absence of the corolla. Ovary 2-celled, the cells with 2 ovules suspended from the top of the septa; style short, at the summit 2-cleft or almost capitate. Drupe berry-like, with an oily pericarp enclosing a long putamen often 2- or by abortion 1-seeded. Embryo erect, with leafy cotyledons. Albumen fleshy or horny.—Trees or shrubs, with opposite simple leaves. Flowers small, in axillary or terminal racemes, corymbs or panicles.

* *Corolla almost rotate, the limb spreading. Inflorescence axillary or at the same time terminal.*

○ Petals only a line or thereabouts long.

Leaves rigidly coriaceous, the nerves impressed; panicles puberulous . . . . . *O. dentata.*

Leaves thin-coriaceous, the nerves prominent; panicles glabrous . *O. dioica.*

○○ Petals about 3 lin. long.
Leaves without veins between the nerves . . . . . *O. terniflora.*
* * *Corolla funnel-shaped, with a longer or shorter tube.*
Panicles all terminal, glabrous or pubescent . . *O. robusta.*

1. **O. dentata,** Wall.—An evergreen tree (40—60 + (?) + 3—4), all parts glabrous or the young shoots puberulous; bark rough, brownish grey, about ⅓ in. thick; cut brownish; leaves elliptically oblong to oblong and lanceolate, acuminate at the base, on a 3-4 lin. long petiole usually red-coloured, 3-6 in. long, long but bluntish acuminate, more or less serrate-toothed to almost entire, rigidly coriaceous, smooth and glossy, the nerves and veins impressed beneath; flowers small, yellowish white, both sexes with corolla, dioecious, the males on short but slender puberulous pedicels forming branched, puberulous, cymose panicles, the females sessile or nearly so, by 3 or more, forming a brachiate, poor, puberulous panicle in the axils of the leaves; bractlets minute; petals about a line long; drupes ovoid, the size of a small pea, glabrous.

Hab.—Frequent in the drier hill forests and the hill Eng forests of Martaban and Upper Tenasserim, at 2,000 to 3,000 ft. elevation; also in the tropical forests above Rangoon.—Fl. June-Jan.; Fr. Apr.-May.—l.—SS.=Metam. Lat. p.

Remarks.—Wood white or pale brown, turning dark brown, very heavy, rather coarse-fibrous, but close-grained.

2. **O. dioica,** Roxb.; Bedd. Sylv. Madr. 153.—A pretty large tree with ash-coloured bark, all parts glabrous; leaves oblong to oblong-lanceolate, acuminate at the base, on a 3 to 4 lin. long petiole, 3-5 in. long, shortly acuminate, remotely and sharply serrate, coriaceous, glabrous, the lateral nerves prominent beneath; flowers small, greenish white, dioecious, both sexes pedicelled, the males forming ample glabrous cymose panicles, the females somewhat larger and with (according to Roxburgh also without) corolla, in short racemes forming a simple brachiate long-peduncled glabrous panicle in the axils of the leaves or opposite to them; petals about a line long; drupes nearly globular, the size of a large pea, bluish black, with a 1-seeded putamen.

Hab.—Hills of Chittagong.—Fl. March-Apr.; Fr. July.

3. **O. terniflora,** Kz.—An evergreen tree (30—40 + 10—20 + 3—4), all parts quite glabrous; bark about ¼ in. thick, dark grey, roughish and finely-cracked; cut greenish brown; leaves oblong to obovate-oblong, acute at the base, on a 3-4 lin. long thick petiole, 3-5 in. long, shortly and bluntish acuminate, entire, coriaceous, glaucous-green, glabrous, the nerves beneath tolerably distinct without distinct veins between them; flowers small, white, sessile, usually by 3 or rarely more in a cluster or occasionally solitary and interruptly spiked, forming brachiate, short, stiff, minutely-pubescent panicles arising laterally or collected at the end of the branchlets; calyx pubescent inside, the teeth short and

rotundate; petals linear-subulate, about 3 lin. long; drupes ovoid-oblong, nearly ½ in. long, smooth, bluish black.

Hab.—Frequent in the tropical and moister upper mixed forests of the Pegu Yomah and Martaban down to Tenasserim; also Chittagong.—Fl. Dec.-Jan.; Fr. Jan.—s.—SS.=Metam. SiS.

Remarks.—Wood pale brown, rather heavy, close-grained, of an unequal fibre, but soft.

4. **O. robusta,** Kz. (*Ligustrum robustum,* Roxb.; Bedd. Sylv. Madr. 153; Brand. For. Fl. 310).—An evergreen large tree, all parts glabrous or the young shoots pubescent; leaves oblong to ovate-lanceolate, acuminate at the base, on a slender 2-3 lin. long petiole, 2-3 in. long, acuminate, chartaceous, entire, glabrous; flowers minute, white, on short but slender pedicels, forming a terminal often very ample tawny-puberulous or almost tomentose panicle; calyx obscurely 4-toothed, persistent; corolla funnel-shaped; drupes elliptically oblong, somewhat curved, 3-4 lin. long, glabrous, bluish black.

Var. 2, **pubescens** (*Ligustrum pubescens,* Wall.): panicles more villous; leaves pubescent on the midrib beneath.

Hab.—Hills of Chittagong and Pegu; var. 2: Ava and Upper Tenasserim.—Fl. July-Aug.; Fr. Nov.-Dec.

Remarks.—Wood hard, durable.

CHIONANTHUS, L.

Calyx short, 4-parted. Corolla-tube very short, the limb 4-parted, the lobes quite distinct or slightly connected at the base. Stamens 2, inserted in the tube of the corolla and included; filaments very short. Ovary 2-celled, each cell with a pair of ovules suspended from the summit of the septum; style very short with a notched stigma. Drupe more or less fleshy, enclosing a 1- seeded bony putamen. Albumen none. Embryo with thick plano-convex cotyledons, the radicle superior, very thick and short.—Trees or shrubs, with opposite simple leaves. Flowers small, in axillary panicles, very rarely reduced to sessile clusters.

* *Petals or corolla-lobes very narrow, involute.*

Glabrous; nerves prominent beneath; petals ⅔ lin. long . . . *Ch. minutiflorus.*

** *Petals or corolla-lobes broader, flat or concave, but not involute.*

○ Veins visible between the strong lateral nerves (leaves 3-6 in. long).

Panicles ample, leafy-bracted; nerves impressed on the upper side of the leaves; drupes 1-1½ in. long . . . . . *Ch. Palembanicus.*

Panicles rather small, with minute bracts; nerves prominent on both sides; drupes ½ in. long . . . . . *Ch. macrophyllus.*

○ ○ No visible veins between the nerves (leaves 6-10 in. long).

Panicle minutely puberulous; petals linear . . . . . *Ch. montanus.*

1. **Ch. minutiflorus,** Kz.—An evergreen tree (?), all parts glabrous; leaves obovate to obovate-oblong, acuminate at the base, on a 3-4 lin. long strong petiole, 3-4 in. long, apiculate, entire, coriaceous, glabrous, the lateral nerves curved and thin, impressed above, prominent beneath; flowers minute, very shortly pedicelled, forming rather ample glabrous panicles arising from above the scars of the fallen leaves; bracts minute; calyx glabrous, the lobes broad, rounded or bluntish; petals linear, hardly a line long, convolute and incurved.

Hab.—Martaban east of Tounghoo.—Fl. March.

2. **Ch. Palembanicus,** Miq.—An evergreen tree (20—25 + (?) + 1—1½), all parts glabrous; bark ash-coloured; leaves oblong to broadly lanceolate, tapering in ½-1 in. long petiole, 4-5 in. long, usually bluntish acuminate with a mucro, entire, coriaceous, glabrous, the lateral nerves little prominent and impressed above; flowers small, yellowish, on slender about a line long pedicels, in short little racemes forming a peduncled, brachiate, often leafy-bracted glabrous panicle above the scars of the fallen leaves or arising laterally from the branches; bracts of the primary ramifications leafy, bractlets small, linear-subulate; corolla-lobes about a line long, oblong, the margins incurved; drupes ovoid to oblong, somewhat curved, about 1-1½ in. long, smooth or more usually slightly and longitudinally furrowed, 1-seeded, glabrous, bluish black.

Hab.—Not unfrequent in the coast forests of the Andamans.—Fl. May-June.

3. **Ch. macrophyllus,** Kz.—A small tree, all parts glabrous; leaves oblong-lanceolate to lanceolate, tapering in a ½-1 in. long petiole, 3-5 in. long, shortly acuminate, chartaceous, then thin-coriaceous, entire, glossy above, glabrous, the lateral nerves prominent on both sides; flowers small, white, on about a line long or shorter pedicels, usually by threes, forming a brachiate, slender, but short and lax panicle above the scars of the fallen leaves; petals a line long, blunt, concave; drupes oblong, somewhat curved, about ½ an in. long, smooth, bluish black.

Hab.—Ava hills; in the tropical forests of Upper Tenasserim.—Fr. Jan.

4. **Ch. montanus,** Bl.—An evergreen small tree, all parts glabrous; leaves elongate obovate-oblong to obovate-lanceolate, acuminate and usually narrowed at the base, on a ¾-1 in. long petiole, 6-9 in. long, shortly and abruptly acuminate, entire, coriaceous, very opaque on both sides, the nerves prominent beneath without any veination between them; flowers small, yellowish, sessile or nearly so, forming peduncled, brachiate, minutely puberulous panicles in the axils of the leaves or above the scars of the fallen ones; petals linear,

about a line long; drupes nearly an inch long, oblong or elliptically oblong, glabrous, bluish black.

Hab.—Rather rare in the hill Eng forests of Martaban east of Tounghoo, at 1,500 to 2,500 ft. elevation; Upper Tenasserim.—l.—SS.=Metam.

MYXOPYRUM, Bl.

Calyx urceolate, sharply 4-toothed. Corolla coriaceous, with a short tube, the limb 4-parted, valvate in bud. Stamens 2, inserted at the base of the corolla-tube; anthers thick. Ovary 2-celled, the cells with a solitary erect ovule; stigmas 2, sessile, subulate. Drupes 1- or 2-celled, with a solitary globular or 2 hemispherical seeds, the pericarp fleshy. Albumen horny.—Scandent shrubs, with 4-cornered branches and opposite 3-nerved simple leaves. Flowers minute, in terminal or axillary panicles.

1. **M. smilacifolium,** Bl.—An evergreen, large, scandent shrub, all parts glabrous; leaves oblong to ovate-oblong, acute, and often unequal at the base, on a thick 3-4 lin. long petiole, 4-6 in. long, shortly acuminate, remotely and minutely spinescent-toothed or almost entire, coriaceous, glabrous, 3-plinerved or almost 5-nerved above the base, veined and more or less distinctly net-veined; flowers minute, yellowish, very shortly pedicelled, forming a more or less ample, sessile or peduncled, obsoletely puberulous or glabrous panicle at the end or in the fork of the branches; corolla-lobes clavate-linear; drupes globular or didymous, the size of a large pea, 1-2-seeded, orange-yellow.

Var. 2, **ilicifolium:** leaves somewhat narrower and stronger nerved and veined, strongly and approximately spinose-serrate; panicles short, rather contracted, axillary and leaf-opposite, rarely terminal.

Hab.—Var. 1: in the forests of Chittagong; var. 2: rather frequent in the tropical forests of Martaban.—Fl. Apr. May.—s: l.—SS.=Metam.

AZIMA, Lamk.

Flowers unisexual. Calyx ventricose-bell-shaped, 3- or 4-cleft. Corolla 4-petalled, the petals alternating with the calyx-lobes. Stamens 4, inserted on the torus, alternating with the petals; filaments thickened; anthers almost sagittate, incumbent. Ovary free, 2-celled, the cells with a solitary erect ovule; style short, with an acute stigma. Fruit berry-like, 1- or 2-seeded. Albumen none. Embryo small, with large, flat, orbicular cotyledons.—Shrubs, with more or less 4-cornered branches and opposite simple leaves, usually furnished with 2 stipulary spines at their insertion. Flowers small, in axillary clusters or the clusters racemose.

1. **A. tetracantha,** Lamk.—A straggling dioecious shrub, with 4 angular stems, the branchlets armed with stipulary spines (usually opposite by pairs), all parts glabrous and glaucous-green; leaves ovate to ovate-oblong, more or less rounded at the base, on a slender about 2 lin. long petiole, 1½-2 in. long, acute or bluntish with a mucro, almost coriaceous, glabrous; flowers small, yellowish white, the males sessile, the females apparently pedicelled; berries globular, the size of a small pea, on nearly a line long or longer peduncles, fleshy, smooth and glossy, flesh-coloured.

Hab.—Frequent in the dry forests and in shrubberies of Ava and Prome.—Fr. March.—l.—SS.=CaS. Ca.

APOCYNEÆ.

Flowers regular, hermaphrodite. Calyx free, 5-parted, or the sepals distinct, imbricate in bud, bearing occasionally small glands or scales inside at the base. Corolla-lobes 5, spreading, twisted-imbricate or rarely valvate in bud, the throat sometimes closed with a corona of scales, and often hairy. Stamens 5, inserted in the tube and alternating with the corolla-lobes; anthers erect, turned inwards, 2-celled, the cells opening in longitudinal slits, either free and included in the usually swollen part of the corolla-tube, or sometimes exserted and connate or connivent in a cone or ring round the style. Pollen not collected in masses, but the auricles at the base of the anthers or the tips occasionally without pollen. Ovary 2-celled with axile placentas or more usually the 2 carpels distinct and with parietal placentas, the cells or carpels with few to numerous ovules in 2 or more rows attached to the placentas; styles 1 or 2, distinct at the base, but united upwards; stigma usually thickened, mitre-like, membranous or bulbous at the base, terminating in a short, entire or 2-cleft point. Fruit either a single drupe or berry, or more frequently each or one of the carpels forms a follicle opening along the inner edge, or a drupe or berry. Seeds pendulous or rarely ascending or peltately attached, usually albuminous, often bearing a coma or tuft of hairs at one or both ends. Embryo straight, with flat or rarely convolute cotyledons.—Trees or shrubs, often climbing, rarely perennials, the juice usually milky. Leaves opposite or whorled, rarely alternate, simple, with or without gland-like small interpetiolar stipules. Flowers usually cymose or cymose-panicled, axillary or terminal. Bracts usually very small, rarely larger and coloured, deciduous; bractlets usually none.

Poisonous principles prevail, and the ordeal nut (*Thanginia venenifera*) stands foremost in this regard. The seeds of *Cerbera manghas*, *Thevetia* and others, and the whole plant of the common oleander (*Nerium oleander*) are formidable poisons. For this

reason several of these are used as emetics, narcotics or cathartics. Strychnine is produced from the clearing nut and the nux-vomica (*Strychnos*). Others are used as febrifuges, like the conessi bark (*Holarrhena antidysenterica*), the bark of *Thevetia neriifolia*, or the root of *Ophioxylon serpentinum*, etc. Caoutchouk, or a substance similar to it, is supplied by several of the climbing members of this family, and that of *Chavannesia esculenta* and *Urceola elastica* are said to be equal to the genuine one. Only a very few have eatable fruits, like *Willughbeia edulis*, *Carissa carandas*, and a few others. *Wrightia tinctoria* yields indigo of a fair quality. The timber, with a few exceptions, is indifferent and even valueless. All the Burmese species (about 57) are woody plants.

* *Seeds naked*, i. e. *without a tuft of hairs at their extremities. Anthers free.*

× Ovary 1-celled, with 2 parietal placentas.

○ Fruit a dehiscent capsule.

Corolla-throat with scales, the anthers included in the tube; albumen scanty; erect shrubs, with large flowers . . . . *Allamanda.*

○○ Fruit an indehiscent drupe or berry.

Corolla-throat naked; seeds in pulp; albumen none; scandent shrubs . . . . . *Willughbeia.*

×× Ovary entire, 2-celled, with axile placentas, or the carpels more or less distinct, each with a single placenta.

○ Ovary entire, 2-celled, with axile placentas.

\+ Corolla valvate in bud.

Corolla-throat naked or bearded; berry corticate or sappy; seeds in pulp; trees or scandent shrubs . . . . . *Strychnos.*

\+\+ Corolla twisted in bud.

† Corolla-throat furnished with 5 or 10 scales or appendages; anthers included.

Hypogynous disk fleshy; drupe unequally 2-celled, not pulpy; trees or erect shrubs, with large flowers . . . . . *Thevetia.*

Nectary none; berry incompletely 2-celled, the seeds in pulp; albumen fleshy; scandent shrubs . . . . . *Melodinus.*

†† Corolla-throat naked.

Corolla funnel-shaped, hairy within; berry 3-1-seeded, sappy; style short; albumen present; shrubs or small trees, usually spiny. *Carissa.*

Apparently as preceding, but style filiform; nectary none; shrubs, probably scandent . . . . . *Winchia.*

Corolla elongate-funnel-shaped; calyx gamosepalous, toothed; drupe sappy, 1-seeded; herbs or undershrubs . . . . . *Rauwolfia.*

○○ Ovary consisting of 2 more or less distinct carpels, each with a single placenta.

\+ Fruit-carpels drupaceous, indehiscent.—Trees.

Sepals free, reflexed; drupes by abortion usually singly, woody-fibrous . . . . . *Cerbera.*

Calyx gamosepalous, the lobes short, erect; drupes usually paired, fleshy-fibrous. . . . . *Ochrosia.*

\+\+ Fruit-carpels follicular, dehiscing along the inner edge; corolla-throat naked.

† Seeds imbedded in pulp.

Follicle continuous, several-seeded; albumen and nectary none erect shrubs . . . . . *Tabernæmontana.*

†† Seeds without pulp.

§ Albumen present.

Follicle elongate, moniliform-contracted between the seeds; albumen horny; shrubs, more or less scandent . . . . . *Gymnopogon.*

Follicle elongate-linear, continuous, many-seeded; albumen fleshy; erect shrubs or undershrubs . . . . . *Vinca.*

§§ Albumen none.

Follicle broad, obliquely truncate, 1-seeded; shrubs . . . *Calpicarpum.*

Follicle elongate, acuminate, many-seeded; fleshy trees or shrubs . *Plumeria.*

* * *Seeds furnished at one or both ends with a tuft of long silky hairs, or rarely silk-hairy all along the borders; anthers free or usually cohering into a cone.*

× Ovary entire, 2-celled; corolla-throat without scales.

○ Seeds comose at the hilum; albumen fleshy.—Scandent shrubs.

Hypogynous glands 5; follicle woody; flowers large and showy . *Beaumontia.*

Hypogynous scales 5, free or connate; filaments often spirally twisted; follicle leathery; flowers small . . . . . *Parsonsia.*

○○ Seed comose at the apex.—Scandent shrubs.

Nectary cupular or 5-parted; anthers exserted; albumen scanty. *Vallaris.*

×× Ovary consisting of 2 distinct carpels.

○ Corolla-throat naked, without scales. Seeds comose at the apex or pilose-fringed all round.

† Nectary none or rudimentary.—Trees.

Seeds comose at the apex; albumen none . . . . . *Holarrhena.*

Seeds fringed all along the borders, more so at both extremities; albumen scanty . . . . . *Alstonia.*

†† Nectary annular, cupular, or consisting of 5 free or connate scales.—Scandent shrubs.

§ Anthers included in the corolla-tube; nectary cupular or 5-cleft.

‖ Follicle continuous, not moniliform.

‡ Seeds not contracted in a long neck.

Corolla tubular, hardly imbricate; seeds with a double coma, the outer one very short, formed by the testa . . . . . *Urceola.*

Corolla salver-shaped, dextrorsely twisted, disk-lobes epigynous round the ovary, almost connate . . . . . *Epigynum.*

Corolla salver-shaped, twisted; disk-lobes on the top of the ovary, distinct, thread-like, capitate . . . . . *Ichnocarpus.*

Corolla salver-shaped, twisted; flollicle woody-coriaceous; albumen scanty . . . . . *Aganosma.*

Corolla salver- and funnel-shaped, twisted; follicle woody; albumen scanty; flowers large . . . . . *Chonemorpha.*

‡‡ Seeds at apex narrowed in a long slender neck.

Albumen none; follicle coriaceous; cymes axillary . . . *Cercocoma.*

Seeds albuminous; follicle woody-coriaceous . . . . *Anodendron.*

Albumen scanty; follicle coriaceous; cymes in terminal panicles . *Ecdysanthera.*

‖ ‖ Follicle moniliform.

Calyx glandular inside; follicle coriaceous . . . . . *Parameria.*

§§ Anthers exserted, cohering in a cone round the stigma.

Nectary of 5 glands; flowers small . . . . . *Pottsia.*

○○ Corolla-throat with a corona of scales or fringes; nectary none.

+ Anthers exserted, united or cohering in a cone round the stigma.

Corolla-lobes elongate or caudate, bordered by membranous lobes or scales, each produced into 2 longer or shorter segments; shrubs, usually scandent . . . . . *Strophanthus.*

Corona of corolla consisting of 5 or 10 erect scales either distinct or united; trees or erect shrubs . . . . . *Wrightia.*

++ Anthers included in the corolla-tube.

Corolla-throat with 5 laciniate-toothed scales; seeds albuminous; erect trees or shrubs . . . . . *Nerium.*

ALLAMANDA, L.

Calyx 5-parted, the segments lanceolate or oblong. Corolla bell- or funnel-shaped with a shorter or longer tube, the lobes twisted in bud, the throat furnished with scales consisting of hairs which are 2-parted and opposite to the corolla-lobes. Anthers sagittate. Nectary fleshy, simple. Ovary conical, entire, 1-celled, with numerous campylotrop ovules along the two parietal placentas; stigma 2-lobed. Capsule compressed-ellipsoid, echinate, opening in 2 valves bearing the septas along their borders. Seeds in two rows, compressed and rotundate. Albumen scanty. Embryo with leafy cotyledons.—Shrubs or trees, with opposite or usually whorled entire leaves. Flowers large, yellow, in poor terminal corymbs.

1. **A. cathartica,** L.—An evergreen large shrub, all parts glabrous; leaves whorled or opposite, obovate- to oblong-lanceolate, decurrent on the short petiole, $2\frac{1}{2}$-$3\frac{1}{2}$ in. long, acuminate, entire, membranous, glossy above and often pubescent on the midrib beneath; flowers large, yellow, on about a line long pedicels, forming a poor, terminal, short-peduncled, glabrous corymb; corolla funnel- bell-shaped, the tube slender, up to an inch long, the inflated limb about as long; calyx-lobes oblong-lanceolate.

Hab.—Of American origin, often cultivated by Burmans and sometimes half-wild in village shrubberies.—Fl. R.S.

WILLUGHBEIA, Roxb.

Calyx 5-parted, the segments without glands. Corolla almost funnel-shaped, with a short tube inflated at the middle, naked at the throat; limb 5-cleft, twisted in bud. Stamens 5, included in the inflated part of the tube; anthers more or less ovate, somewhat longer than the filaments. Nectary none. Ovary incompletely 2-celled, the cells with numerous ovules along the two parietal placentas; style short; stigma conically subulate and obscurely 2-lobed. Berry corticate, 1-celled, with numerous ellipsoid seeds imbedded in pulp. Albumen none. Cotyledons thick, plano-convex.—Scandent shrubs, with opposite entire leaves and often with leaf-opposite tendrils. Flowers in axillary cymes.

Cymes cluster-like, short-peduncled; berry ovate, smooth . . *W. edulis.*
Clusters sessile or nearly so; berry globular, wrinkled . . *W. Martabanica.*

1. **W. edulis,** Roxb.—An evergreen, large, scandent shrub with long-hooked tendrils opposite the leaves or in the forks of the branches, all parts glabrous; leaves opposite, shortly petioled, oblong, 3-5 in. long, acuminate, entire, polished, glabrous, parallely veined; flowers middling-sized, pale pink-coloured, shortly pedicelled, forming a short-peduncled axillary or terminal cluster; calyx 5-toothed, the segments ovate, almost ciliate; corolla funnel-shaped, a little hairy inside of the tube, the lobes nearly lanceolate; berry almost ovate, the size of a large lemon, covered with a thick, friable, smooth, brownish-yellow rind, 1-celled, many-seeded, the seeds of the size of a small garden-pea, imbedded in the yellowish pulp intermixed with softer cottony fibres.

Hab.—Chittagong,—Fl. Fr. nearly ∞.

Remarks.—Yields an inferior sort of caoutchouk.

2. **W. Martabanica,** Wall.—*Thit-kyouk-nway.*—An evergreen, large, scandent tendril-bearing shrub, all parts glabrous; leaves elliptical to elliptically obovate, narrowed in a short petiole, 3-4 in. long, apiculate, entire, glabrous, chartaceous, glossy, with numerous parallel veins; flowers middling-sized, almost sessile, forming a sessile or almost sessile cluster in the axils of the leaves or at the end of the branchlets; calyx-lobes oblong, rounded, minutely ciliate; corolla about 3 lin. long; berries globular, about 3 in. in diameter, wrinkled, yellowish, glabrous; seeds numerous, oval, imbedded in a yellowish-reddish pulp.

Hab.—Upper Tenasserim.—Fr. Apr.

STRYCHNOS, L.

Calyx 5-lobed. Corolla tubular-salver- or almost funnel-shaped, very rarely the lobes free almost to the base, naked or bearded at the throat, the limb 5-parted and valvate in bud. Stamens 5, inserted at the throat; filaments very short; anthers almost exserted. Ovary 2-celled, the cells with several or numerous ovules attached to the fleshy placentas; style filiform, with a capitate entire or obsoletely 2-lobed stigma. Berry globular, many- to 1-seeded, the rind often hard. Seeds more or less compressed, imbedded in pulp.—Trees or shrubs, often scandent by means of hooked woody tendrils, with opposite 3-5-nerved entire leaves. Flowers in axillary or terminal cymes, clusters or panicles.

* *Scandent shrubs, with woody, hooked, 2-cleft tendrils.*

Corolla-tube 1½ lin. long, bearded at the throat; berry oblong, 1-seeded, with a membranous skin . . . . . *S. laurina.*

Corolla consisting of 5 free glabrous petals; berry globular, 1- (or 2-?) seeded, the skin coriaceous . . . . . *S. acuminata.*

** *Erect trees without tendrils.*

○ Corolla not villous at the throat, the tube long.
Corymbs peduncled, terminal or on axillary shoots; berries the size of an orange or smaller, several-seeded, the rind thick, corky . *St. nux-vomica.*
○○ Corolla villous at the throat.
Panicles very short, axillary; corolla-tube about 2 lin. long; berries 1-seeded, the rind coriaceous . . . . . *S. potatorum.*
Panicles brachiate, large, terminal; corolla-tube 4-5 lin. long . *S. Wallichiana.*

1. **S. laurina,** Wall.—An evergreen scandent shrub with woody 2-cleft tendrils, all parts glabrous; leaves from ovate-oblong to oblong- and elliptically-lanceolate, rounded or obtuse at the base and tapering in a 3-4 lin. long petiole, 3-4 in. long, shortly acuminate, entire, rigidly chartaceous, glabrous, shining above, 3- or almost 5-plinerved above the base; flowers 5-merous, small, forming short, minutely puberulous, almost sessile panicles in the axils of the leaves or larger ones at the end of the branchlets; corolla-tube 1½ lin. long, upwards somewhat broader, the lobes about a line long, densely bearded at the base; ovary villous; berries oval, about an inch long, with a membranous skin, containing a single large seed conform with the berry.

Hab.—Tenasserim, from Moulmein down to Mergui.—Fl. Aug.

2. **S. acuminata,** Wall.—An evergreen, large, scandent shrub, with tendrils, all parts glabrous or the very young shoots minutely puberulous; leaves broadly oblong to ovate-oblong, rounded at the base and tapering in a 2-3 lin. long petiole, 4-5 in. long, rather abruptly acuminate, entire, rigidly chartaceous, 5-plinerved, glabrous and glossy; flowers small, greenish white, on nearly a line long puberulous pedicels, forming very short, puberulous, fascicle-like racemes arising by pairs or singly from the axils of the leaves; corolla consisting of 5 petals, free or only at the base slightly cohering, 2 lin. long, glabrous; berries globular, the size of a small cherry, 1- (or also 2- ?) seeded, the skin thin-coriaceous, brown, smooth.

Hab.—Not unfrequent along the rocky sea-shores of South Andaman; also Tenasserim.—Fl. Fr. Apr.-May.—l.

3. **S. nux-vomica,** L.; Bedd. Sylv. Madr., t. 243; Brand. For. Fl. 317.—*Kha-boung.*—A tree (30—40 + 12—15 + 3—4), shedding leaves in H.S., all parts glabrous; leaves ovate to elliptically oblong, somewhat unequal at the rounded base and tapering in a short petiole, 3-6 in. long and often nearly as broad, shortly acuminate or almost apiculate, entire, while very young membranous, then rigidly chartaceous, glossy above, glabrous, 3-5-plinerved; flowers small, green, appearing with the young leaves, on short but slender pedicels, forming longer or shorter peduncled minutely puberulous cymes at the end of the branchlets or on short axillary shoots; corolla tubular, with a 5-lobed reflexed short limb, the tube about ⅓ in. long, glabrous

at the throat; berries globular, with a hard thick rind, the size of a billiard-ball or smaller, orange-coloured to brown, smooth, many-seeded; seeds about ½ in. long, somewhat compressed-oblong, appressed silky-pubescent.

Hab.—Common in the leaf-shedding forests, especially the upper mixed and low forests, all over Burma from Ava and Martaban down to Tenasserim, up to 2,000 ft. elevation.—Fl. Apr.-May; Fr. C.S.—l.—SS. = ∞ SiS. Arg.

Remarks.—Wood white or grey, close-grained and hard. □′=52 pd. Used for ploughs, shares, cart-wheels, also for making cots and fancy cabinet work. The tree produces the poison nut or nux-vomica of commerce.

4. **S. potatorum,** L. f.; Bedd. Sylv. Madr. 163; Brand. For. Fl. 317.—A leaf-shedding tree (25—30 + 10—12 + 3—4), all parts glabrous; leaves ovate to ovate-oblong, often unequal at the acute or obtuse base, on hardly a line long petiole, 2-2½ in. long, bluntish or bluntish acuminate, entire, rigidly chartaceous, glabrous, glossy above, almost penninerved with a thinly 3-nerved base; flowers small, green, on short but slender pedicels, forming small fascicle-like glabrous cymes arising solitary or by pairs from above the scars of the fallen leaves; corolla almost salver-shaped, with a 5-cleft reflexed limb of the length of the about 2 lin. long tube, villous-bearded at the throat; berries globular, about an inch in diameter, 1-seeded, the rind thin-coriaceous, smooth and bluish black; seed imbedded in purplish pulp, orbicular, slightly compressed, nearly ½ an in. in diameter, shortly silky-villous.

Hab.—Not unfrequent in the open and dry forests of the Prome district.—Fr. Sept.-March.—l.—SS.=CaS. Dil.

Remarks.—Wood greyish pale-brown, very heavy, close-grained, hard and durable, takes a beautiful polish. Good for ploughshares, wheels, etc. The seeds possess the quality of purifying muddy water.

5. **S. Wallichiana,** Steud.—An evergreen tree (25—30 + 10—12 + 1½—2½), all parts glabrous; leaves ovate-lanceolate to ovate and elliptically lanceolate, rounded or obtuse at the base and narrowed in a 2-3 lin. long petiole, 2½-4½ in. long, acuminate or shortly and bluntish apiculate, 3- or 5-plinerved, glabrous, chartaceous, glossy on both sides; flowers rather small, green, on very short pedicels, forming a brachiate, trichotomous, minutely-puberulous panicle at the end of the branchlets; corolla tubular, with a very short 5-cleft limb, the tube about ⅓ in. long, very slender and very villous at the throat.

Hab.—Rare in the tropical forests of the eastern slopes of the Pegu Yomah.—Fl. Apr.—s.—SS. = SiS.

THEVETIA, L.

Calyx 5-parted, with or without glands at the base inside, the lobes acute. Corolla funnel-shaped, the tube inside pilose and furnished with 5 prominent processes (excurrent nerves) at the

throat, the lobes sinistrorsely twisted. Anthers 5, lanceolate, almost sessile, inserted below the appendages; filaments adnate, sharply prominent at the base. Hypogynous ring fleshy, obscurely 5-crenate. Ovary entire, 2-lobed at the apex, 2-celled, the cells with 2 ovules inserted at the base to the inner angle; style filiform; stigma depressed-conically-peltate, surrounded by a crenate viscose ring, the cone 2-lobed; drupe transversely and irregularly rhomboid-oval, with a transverse-oblong woody putamen finally tardily dehiscing. Seeds irregularly globular. Embryo straight, with flat cotyledons. Albumen horny.—Milky small trees or shrubs, with alternate entire leaves. Flowers conspicuous, in axillary and terminal almost sessile or peduncled few-flowered corymbs.

1. **T. neriifolia,** Juss.—*Hpa-young-pan.*—An evergreen treelet (15—20 + 6—10 + 1—1½), all parts quite glabrous; leaves linear to narrow-linear, acuminate at both ends, decurrent in a very short petiole or almost sessile, 2-3 in. long, entire, thin-coriaceous, glossy, glabrous; flowers large, yellow, on ½-1 in. long glabrous pedicels, forming a poor corymb in the axils of the leaves or more usually at the end of the branchlets; calyx-lobes lanceolate, acuminate, about 3 lin. long; corolla 1½ to nearly 2 in. long, the tube about ¼ as long, darker yellow; drupes the size of a pigeon's egg or smaller, fleshy, smooth and glossy.

Hab.—Frequently cultivated in villages all over Burma down to Tenasserim and the Andamans.—Fl. Nov.-March.—Fr. C.S.

CARISSA, L.

Calyx 5-parted, the lobes without glands at the base. Corolla salver-shaped, twisted in bud, the tube pilose within and often the throat also bearded; anthers 5, lanceolate, longer than the filament, blunt or apiculate. Ovary entire, spindle-shaped, 2-celled, the cells with a few campylotrop ovules attached to the thick septum; style filiform, thickened at the apex, the stigma 2-lobed. Berry more or less globular or ellipsoid, 2- or by abortion 1-celled, 1-3-seeded. Seeds peltate, rough. Embryo straight, in the axile of the albumen, with an inferior radicle and ovate cotyledons.—Armed shrubs or trees, with milky sap and opposite entire leaves, the spines (reduced peduncles) opposite, simple or forked, often bearing the inflorescence. Flowers small, in peduncled or almost sessile small corymbs or cymes.

* *All parts glabrous.*

Ovary-cells 4-ovuled; berry the size of a plum; leaves usually blunt or retuse . . . . . *C. carandas.*

Ovary-cells 2-ovuled; berry the size of a pea or somewhat larger; leaves usually acute . . . . . *C. diffusa.*

* * *All parts, especially while young, shortly and softly puberulous.*

Ovary-cells 2-ovuled; berry the size of a pea . . . . *C. hirsuta.*

1. **C. Carandas,** L.; Bedd. Sylv. Madr. 156, t. 19, f. 6; Brand. For. Fl. 320.—An evergreen, large, spreading shrub or stunted tree with an irregular bent trunk, armed with long, sharp, simple or forked spines, all parts glabrous; bark grey; leaves from oblong and elliptical to oval and obovate, rounded or obtuse at the base, on a slender 1-1½ lin. long petiole, 1-2 in. long, retuse or rounded and with or without a mucro, entire, chartaceous, glabrous and glossy; flowers white, often pale rose-coloured outside, on 1-2 lin. long, slightly puberulous, glabrescent pedicels, forming a glabrous or nearly glabrous, shorter or longer peduncled, small corymb at the end of the branchlets, or terminating the paired divaricate spines in the forks of the branchlets; calyx puberulous, the lobes lanceolate, acuminate, minutely ciliate; corolla outside puberulous, the tube about ¾ in. long, somewhat inflated upwards, the lobes velvety outside; ovary-cells 4-ovuled; berries the size of a small cherry, ovoid, black and glossy, containing several compressed, oblong, concave seeds.

Hab.—Very frequent in the dry forests of the Prome district.—Fl. March.—I.—SS.=CaS. Dil.

2. **C. diffusa,** Roxb.; Bedd. Sylv. Madr. 157; Brand. For. Fl. 321.—An evergreen large, spreading shrub, armed with usually simple and sometimes curved spines, all parts glabrous; leaves ovate to rotundate-ovate, on a petiole less than a line long or almost sessile, rounded or somewhat cordate at the base, 1-2 in. long, acute or blunt with a mucro, entire, coriaceous, glabrous and glossy; flowers small, white, on about a line long or shorter puberulous pedicels, forming terminal, short-peduncled, puberulous small corymbs; calyx puberulous, the lobes linear-subulate; corolla glabrous, the tube only ½ an in. long or shorter, inflated at the throat; ovary-cells 2-ovuled; berries ovate, the size of a pea or somewhat larger, acute, 2-celled, usually 4-seeded.

Hab.—Along the coast of South Andaman.—Fl. Fr. May.—SS.=Metam.

3. **C. hirsuta,** Roth.—An evergreen large shrub, armed with straight spines, all parts more or less shortly puberulous; leaves from ovate to rhomboid-oblong and broadly lanceolate, obtuse or tapering at the base, on a very short puberulous petiole, 1-1½ in. long, acute, entire, coriaceous, especially while young on both sides shortly and softly puberulous, the lateral nerves obsolete; flowers white, on about a line long puberulous pedicels, forming a short-peduncled puberulous small corymb at the end of the branchlets or terminating the diverging spines in the forks of the branches; calyx puberulous, the teeth lanceolate, acuminate; corolla-tube about ½ an in. long or shorter, puberulous outside; ovary-cells 2-

ovuled; berries oblong or almost globular, the size of a pea, smooth, black, few-seeded.

Hab.—Ava, along the Irrawaddi, apparently frequent.—Fr. Jan.

WINCHIA, A. DC.

Calyx 5-cleft, without glands, the lobes rounded. Corolla salver-shaped, the tube pilose inside, naked at the throat, the lobes oblong, puberulous outside, pilose within, dextrorsely twisted in bud. Stamens 5, alternating with the corolla-lobes, inserted a little above the middle of the tube; anthers lanceolate, acute, almost sessile. Nectary none. Ovary entire, cylindrical, 2-celled, the cells with numerous ovules attached to the thick dissepiment; style filiform; stigma with a thick ring round the base, at the middle cylindrical and terminated by 2 filiform lobes.—Shrubs, probably scandent, with entire parallel-veined whorled leaves. Flowers in terminal, short, trichotomous panicles. Bracts minute, ovate, acute.

Panicle glabrous . . . . . *W. calophylla.*
Panicle minutely puberulous . . . . . *W. atroviridis.*

1. **W. calophylla,** DC.—An evergreen shrub, apparently scandent, all parts glabrous; leaves oblong-lanceolate to lanceolate, acute at the base, on a glabrous petiole ½-1 in. long, 1½-3 in. long, bluntish acuminate, coriaceous, entire, glossy above, elegantly parallel-veined on the pale-coloured under-surface; flowers small, on very short thick pedicels, forming short-peduncled glabrous corymb-like panicles at the end of the branchlets; calyx-teeth rotundate, white-bordered; corolla about 3 lin. long, the tube inflated above the middle, the lobes broad, whitish pubescent.

Hab.—Upper Tenasserim.—Fl. March.

2. **W. atroviridis** (*Chilocarpus atroviridis,* Bl.).—An evergreen scandent shrub, all parts glabrous; leaves elliptical to lanceolate, on a 4-5 lin. long slender petiole, 2-3 in. long, bluntish acuminate, chartaceous, entire, glabrous, parallel-veined on the pale-coloured under-surface; flowers (in bud) on short slender pedicels, forming a minutely puberulous, small, peduncled, trichotomous corymb-like panicle in the axils of the leaves and at the end of the branchlets; calyx-lobes rounded, white-bordered.

Hab.—Tenasserim.

RAUWOLFIA, L.

Calyx 5-parted, without glands. Corolla salver- or almost bell-shaped, with a short, thick or cylindrical, above the middle inflated tube, pilose inside, the lobes sinistrorsely twisted in bud. Stamens

5, inserted below the throat and included in the inflated part; anthers oblong, acute, longer than the filament. Nectary cup-shaped, waved. Ovary 2-celled, compressed, the cells with a pair of ovules attached to the inner angle a little above the base; style with a capitate stigma pilose fringed at the base and round top. Drupe didymous, connate at the base, ovoid, with a wrinkled 1-seeded nut. Albumen fleshy. Embryo with oval cotyledons.—Low shrubs or undershrubs, with opposite or whorled entire leaves. Flowers in terminal cymes or brachiate corymbose panicles.

1. **R. serpentinum,** Benth. (*Ophioxylon serpentinum,* Willd.).—An evergreen, low, erect shrub, ½-1 ft. high, in moister situations larger and more branched, all parts glabrous; leaves obovate-lanceolate to lanceolate, tapering in a shorter or longer petiole, acute or shortly acuminate, 2-5 in. long, entire, membranous, glabrous, pale-coloured beneath; flowers white or (especially the tube) pale rose-coloured outside, on about a line long glabrous pedicels, forming a long-peduncled somewhat compact glabrous cyme in the axils of the leaves or at the end of the branches; calyx-lobes lanceolate, acute; corolla nearly an inch long, with a long slender tube; drupes 2-lobed, the lobes ovoid, the size of a pea, sappy, glossy, crimson.

Hab.—Very frequent in the mixed and open, especially in the savannah forests, all over Pegu and Martaban down to Tenasserim.—Fl. Apr.-May.—s.+l.—SS.=∞.

CERBERA, L.

Calyx 5-parted, without glands, the sepals free, reflexed. Corolla salver-shaped, sinistrorsely twisted in bud. Stamens 5, inserted at the middle of the tube; anthers linear-lanceolate, cuspidate, much longer than the filaments. Ovaries 2, ovoid, each with 4 ovules attached to the prominent placenta; style filiform; stigma conical, 10-furrowed at base and 2-lobed at the apex. Drupe by abortion singly, ellipsoid to globose, with a woody-fibrous mesocarp, the putamen woody half-way, 2-valved and incompletely 2-celled, 2- or 1-seeded. Albumen none. Embryo with fleshy ovate-oblong cotyledons.—Trees, with alternate or crowded leaves. Flowers conspicuous, in terminal corymb-like panicles.

1. **C. Odollam,** Gaertn.; Bedd. Sylv. Madr. 157; Brand. For. Fl. 322.—*Ka-lwah.*—An evergreen tree (40—50 + 10—15 + 3—4), all parts glabrous; leaves lanceolate to obovate-lanceolate, tapering in a slender 1-1½ in. long petiole, 4-6 in. long, shortly acuminate or apiculate, entire, thin-coriaceous, glabrous and glossy; flowers white, on nearly ½ in. long glabrous pedicels, forming a shorter or longer peduncled, reflexed-bracted, glabrous, robust, corymb-like panicle at the end of the branchlets; calyx-lobes about ½ an in.

long, almost foliaceous and sepal-like, lanceolate, acuminate, reflexed; corolla-tube nearly ½ an in. long, the triangularly-falcate lobes nearly as long or longer; drupes oval to elliptical, the size of a duck's egg, fibrous-woody, the epicarp smooth, green, then brown or blackish when fully ripe.

Hab.—Not unfrequent in the littoral, chiefly the tidal, forests from Chittagong and Arracan down to Tenasserim and the Andamans.—Fl. March-May.—l.—SS.=Sal.

Remarks.—Wood white, very soft and spongy. Seeds yielding an oil for lamps.

OCHROSIA, Juss.

Calyx 5-lobed, without glands, the lobes short and erect. Corolla salver-shaped, dextrorsely twisted in bud, the tube cylindrical and somewhat inflated above the middle, the throat without scales. Stamens 5, inserted in the inflated part of the corolla-tube; anthers sagittate, longer than the filaments. Nectary none. Ovary of 2 distinct carpels, often cohering at the apex and united by the filiform style, with 2-4 ovules in each carpel; stigma conical. Drupes usually paired, free or connate at the base and more or less diverging, rarely by abortion singly, the putamen woody or horny, usually fibrous externally, 2-4- rarely 1-seeded. Albumen scanty. Embryo with flat almost orbicular cotyledons and an elongate radicle.—Trees or shrubs, with opposite or crowded leaves. Flowers small, in terminal or almost terminal, small, corymb-like cymes.

1. **O. salubris,** Bl.—An evergreen tree (20—25+15—20+3—4), all parts glabrous; leaves obovate or elongate-obovate, acute at the base, on a ½-1½ in. long petiole, 6-8 in. long, rounded or obsoletely apiculate, thin-coriaceous, entire, glabrous and glossy, parallel-nerved; flowers small, white, shortly pedicelled, forming a trichotomously branched, glabrous, large, corymb-like panicle at the end of the branchlets or in the axils of the upper leaves, the long-peduncled partial corymbs often supported by larger or smaller floral leaves conform with the stem-leaves; calyx-lobes lanceolate, acute, of a thick texture; corolla-tube only about 2 lin. long, the lobes longer; drupe-lobes ellipsoid-oblong, about 2 in. long.

Hab.—Rare in the tidal forests of the Andamans.—s.—SS.=Sal.

TABERNÆMONTANA, Plum.

Calyx 5-parted, with a ring of small linear glands at the base inside. Corolla salver-shaped, the tube cylindrical, slightly swollen round the anthers, the throat without scales, the lobes spreading,

twisted in bud. Stamens 5, usually included in the corolla-tube, the anthers usually sagittate and acuminate, or linear. Nectary none. Ovary consisting of 2 distinct carpels united by the style, each carpel with numerous ovules; stigma thickened, often with a membranous ring round the base. Drupes by pairs or solitary by abortion, obliquely oblong or nearly globular, distinct or rarely united at the base, more or less fleshy or pulpy, either indehiscent or tardily opening along the inner face. Albumen fleshy. Embryo with leafy cotyledons and a superior radicle.—Shrubs or rarely trees, with opposite entire leaves. Flowers in cymes, often by pairs in the axils of the uppermost leaves. Bracts usually very small.

* *Bractlets persistent, conspicuous, longer than the pedicels.*

Corolla-lobes longer than the tube; calyx-lobes 2-3 lin. long, linear-lanceolate . . . . . *T. recurva.*

Corolla-lobes half as long as the tube . . . . . *T. calycina.*

** *Bracts and bractlets very deciduous and small, or persistent and minute.*

× Follicles tapering at the base but not stalked, without an appendage, (usually cylindrical with 6 longitudinal often elevated lines).

○ Calyx-lobes acute or acuminate. Anthers inserted towards the upper end of the corolla-tube.

Flowers large, showy; corolla-lobes as long as the tube . . *T. divaricata.*

Calyx-lobes ovate and almost leafy, 3-4 lin. long; corolla-lobes nearly as long as the tube . . . . . *T. alternifolia.*

Corolla-lobes about half as long as the tube, or shorter.

Corolla nearly an inch long; calyx-lobes rather acute . . . *T. rostrata.*

Corolla hardly ½ an inch long; calyx-lobes acute . . . . *T. ophiorhizoides.*

Doubtful species; calyx-lobes ovate, rather blunt . . . . *T. graciliflora.*

Doubtful species . . . . . *T. microcarpa.*

○○ Calyx-lobes subulate-acuminate or rotundate, less than a line long; anthers inserted below the middle of the corolla-tube.

Corolla-tube slender, ⅝ in. long, the lobes half as long or shorter; calyx-lobes subulate-acuminate . . . . . *T. membranifolia.*

×× Follicles long-stalked, terminating in a coriaceous acuminate appendage.

Calyx-lobes rounded at the apex . . . . . *T. subcapitata.*

1. **T. calycina,** Wall.—Glabrous; leaves oblong-lanceolate, acute at the base, blunt-acuminate, membranous, glabrous, on a 4-6 lin. long petiole dilated at the base, 3-4 in. long; flowers 9 lin. long, on pedicels shorter than the calyx, forming usually 2 naked, dichotomously-branched, glabrous cymes on a peduncle twice as long as the petiole, arising from the fork of the upper branchlets; bracts conspicuous, 2-3, linear-acuminate, arising from the middle of the pedicel and twice the length of the calyx; calyx-lobes ovate, acuminate, ciliolate; corolla 9 lin. long, the lobes half the length of the tube.—(*DC. Prod.*)

Hab.—Tenasserim.

2. **T. recurva,** Roxb.—*Tau-sa-lap.*—A shrub, 2 to 4 ft. high, all parts glabrous; leaves oblong-lanceolate to ovate-oblong, acute at the base, on a 2-4 lin. long petiole, shortly acuminate or bluntish, 2-4 in. long, membranous, entire, glabrous, pale-coloured beneath; flowers white, showy, on thick glabrous pedicels shorter than the calyx and supported by a pair of linear-lanceolate bractlets of 3 to 5 lin. length, forming short-peduncled glabrous spreading or recurved poor cymes arising usually by pairs from the forks of the branchlets; calyx-lobes 2-3 lin. long, linear-lanceolate, glabrous; corolla-tube rather robust, nearly ½ an in. long, the lobes elongate-obovate-oblong, longer than the tube.

Hab.—Frequent in the tropical forests of the southern slopes of the Pegu Yomah above Rangoon and Tenasserim; also Chittagong.—Fl. May-June.

3. **T. divaricata,** Bl.—An evergreen shrub, 1-3 ft. high, all parts glabrous; leaves lanceolate to elliptically lanceolate, tapering in a slender 2 to 4 lin. long petiole, 2-3 in. long, rather long but bluntish acuminate, entire, firmly membranous, glabrous, pale-coloured beneath; flowers white, showy, on 3 to 6 lin. long pedicels, forming poor, peduncled, glabrous, corymbose cymes arising by pairs or singly from the fork of the branches; calyx glabrous, about a line long or somewhat longer, the lobes ovate, acute or rounded on the same individual; corolla-tube about an in. long or shorter, the lobes nearly as long, broad, entire; follicles about 1-1½ in. long, acuminate at both ends, striate, glabrous.

Hab.—Very generally cultivated in native gardens all over Burma and adjacent islands.—Fl. Oct.-Dec.

4. **T. alternifolia,** L.—An evergreen large shrub, 4 to 8 ft. high, all parts glabrous; leaves usually opposite, oblong-lanceolate to obovate-lanceolate, tapering in a very short petiole, 2-5 in. long, shortly acuminate or apiculate, entire or waved, firmly membranous, glabrous, pale-coloured beneath; flowers white, on glabrous pedicels varying from a few lines to an in. in length, forming few-flowered or large, corymbose, glabrous, long and strongly peduncled cymes arising singly or by pairs from the forks of the upper branches; calyx-lobes almost leafy, about 3-4 lin. long, ovate to cordate-ovate, rather acute, glabrous; corolla-tube about ½ in. long, the lobes somewhat shorter, waved; follicles glabrous, usually 4-seeded.

Hab.—Frequent along the coast of the Andamans.—Fl. Apr.-May.

5. **T. rostrata,** Wall.—A glabrous shrub; leaves elliptically oblong, acute at the base, 3-5 inch long, on a 2-3 lin. long petiole, bluntish acuminate, entire, glabrous, membranous, pale-coloured beneath; flowers conspicuous, on 2-3 lin. long pedicels, forming very short, glabrous, poor cymes arising solitary or in pairs from the

fork of the branchlets; bracts only about a line long, ovate, acute; calyx-lobes oblong, rather acute; corolla-tube nearly an inch long, the lobes nearly 3 times shorter than the tube; follicles oblong, nearly an inch long, diverging, almost beaked-acuminate, 1-3-seeded.

HAB.—Ava.—Fl. Fr. Nov.

6. **T. ophiorrhizoides,** Kz.—An evergreen shrub, 2-4 ft. high, all parts glabrous; leaves obovate-oblong to broadly lanceolate, tapering into a very short (2-3 lin.) petiole, or some of the leaves almost sessile, 3-5 in. long, shortly acuminate, entire, membranous, glabrous, pale-coloured beneath; flowers on 1-1½ lin. long pedicels, forming shortly peduncled, occasionally almost sessile, glabrous, few-flowered cymes, arising by 3 or 2, or rarely more, from the fork of the upper branchlets; bracts and bractlets minute, deciduous; calyx glabrous, very short, 5-cleft, the segments hardly a line long, lanceolate, acute; corolla-tube rather thick, about 4 lin. long, inflated at the apex, the lobes hardly half as long as the tube.

HAB.—Frequent in the hill forests of the Martaban hills, at 3,000 to 5,000 ft. elevation.—Fl. Apr.—SS.=Metam.

7. **T. graciliflora,** Wall.—Glabrous; leaves oblong, acute at the base, blunt-acuminate, on a 2 lin. long petiole dilated at the base, membranous, 2-4 in. long; flowers about an inch long, on pedicels 3 times longer than the calyx, forming a naked, much dichotomously branched cyme on a 2-3 in. long peduncle arising from the fork of the branchlets; calyx-lobes ovate, rather blunt; corolla-tube very long, slender, the lobes oblong, 3 or 4 times shorter than the tube.—(*DC.*)

HAB.—Tenasserim.

8. **T. microcarpa,** Wall.—Glabrous; leaves oblong, acuminate, glabrous, 5 in. long, tapering in a 4-5 lin. long petiole, pale-coloured beneath; cymes glabrous, 4-5-flowered, on peduncles 3 times longer than the petiole, terminal; pedicels 8 lin. long, divaricate; calyx-lobes ovate, acute; follicles 4-5 lin. long, ellipsoid, 1-seeded.—(*DC. Prod.*)

HAB.—Ava hills.

9. **T. membranifolia,** Kz.—An evergreen shrub, 3-4 ft. high, all parts glabrous; leaves lanceolate to broadly lanceolate, tapering into a 3 to 5 lin. long petiole, 3-5 in. long, long and thinly acuminate, entire, membranous, glabrous, almost one-coloured; flowers white, on very slender, 4-6 lin. long, glabrous pedicels, forming usually paired, shortly peduncled, much dichotomously branched, glabrous, corymb-like cymes in the fork of the upper branchlets; bracts none or very minute and deciduous; calyx minute, the lobes

linear-subulate, hardly a line long; corolla-tube slender, ¾ in. long, slightly inflated round the anthers below the middle, the lobes linear-lanceolate, acuminate, about half as long as the tube or shorter.

Hab.—In the tropical forests of Martaban, east of Tounghoo.—Fl. Apr.-May.—s.—SS.=Metam.

10. **T. subcapitata,** Wall.—An evergreen shrub, all parts glabrous; leaves oblong to oblong-lanceolate, tapering into a ⅓-½ in. long petiole, bluntish acuminate, 2½-5 in. long, entire, membranous, glabrous, somewhat paler beneath; flowers small, white, on glabrous 2-3 lin. long pedicels, forming glabrous, shorter or longer peduncled cymes arising singly or by 2 or rarely 3 from the fork of the upper branchlets; bractlets minute, deciduous; calyx glabrous, hardly a line long, the lobes rounded at the apex; corolla-tube rather wide, nearly 3 lin. long, the lobes short, hardly half as long as the tube; follicles obliquely oblong, about ⅔ in. long, narrowed into a thick long stalk and compressed into a sterile truncate appendage terminating into a falcate point, glabrous, 1- or 2-seeded.

Hab.—Pegu; Tenasserim.—Fl. Dec.

GYNOPOGON, Forst.

Calyx 5-parted, without glands. Corolla salver-shaped, twisted in bud, the tube usually inflated from the middle and constricted at the apex, the throat naked or somewhat gibbose. Stamens 5, inserted in the tube; filaments very short; anthers lanceolate. Hypogynous ring pilose or none. Ovary of 2 distinct ovoid-spindle-shaped carpels, united by a single style, each carpel with 4 to 6 ovules in 2 rows; stigma capitate or oblong. Drupes paired or by abortion solitary, stalked, usually ellipsoid and 1-seeded, or consisting of 2 or rarely more 1-seeded joints placed end to end. Seeds naked, furrowed or concave on the inner face. Albumen horny. Embryo axile, with oblong blunt cotyledons.—Shrubs, usually more or less scandent or climbing, with opposite or more usually whorled leaves. Flowers small, in small heads or clusters, or in short spikes or spike-like panicles, terminal or axillary. Bracts very small.

Corolla-tube nearly ½ an in. long . . . . . *G. stellatum.*
Corolla-tube only about 2 lin. long . . . . . *G. breviflorum.*

1. **G. stellatum,** Labill.—An evergreen scandent shrub, all parts quite glabrous; leaves whorled by 3 or 4, elliptically lanceolate to lanceolate, acute at the base, on a rather slender 2-3 lin. long petiole, bluntish or bluntish apiculate, 2-3 in. long, entire,

thin-coriaceous, glabrous and glossy, parallel-veined; flowers small, white, on very short and thick pedicels, forming a short, glabrous, sessile or nearly sessile small cyme at the end of the branches; calyx sharply 5-cornered, 5-toothed, glabrous; corolla nearly ½ an in. long, the tube slender; drupes elliptical, the size of a very large pea, shortly stalked, smooth.

HAB.—Along the rocky shores of Tenasserim and the Andamans.

2. **G. breviflorum**, Kz.—An evergreen, large, scandent shrub, all parts quite glabrous; leaves whorled by 3 or opposite, oblong-lanceolate to lanceolate, acuminate at the base, on a 2-3 lin. long petiole, long but bluntish acuminate, 2-3 in. long, thin-coriaceous, entire, glabrous, obsolètely parallel-veined; flowers small, on short glabrous pedicels not exceeding a line, forming a sessile, trichotomous, glabrous cyme in the axils of the leaves and at the end of the branchlets; calyx glabrous, the lobes lanceolate, acuminate; corolla-tube only about 2 lin. long, the lobes somewhat shorter than the tube; drupes elliptical, on a 1-2 lin. long slender stalk, pointed, glabrous.

HAB.—In the tropical forests of Martaban and Upper Tenasserim, at 2,000 ft. elevation.

3. **G. lanceolatum** (*Hunteria lanceolata*, Wall.).—Leaves opposite, elliptically lanceolate, abruptly narrowed at the base, bluntish acuminate, many-nerved, coriaceous, glabrous; cymes many times shorter than the leaves; calyx-lobes ovate, acute; drupes obovoid, ½ an in. long, 1-seeded.—Habit of *Hunteria corymbosa*, Roxb.: the leaves somewhat smaller and narrower (12-15 lin. broad), the lateral nerves more numerous.—(*DC. Prod.*)

HAB.—Tenasserim.

VINCA, L.

Calyx 5-parted, the lobes acuminate. Corolla salver-shaped, sinistrorsely twisted, with a longer or shorter tube, pilose within, the throat callose-cornered. Stamens 5; anthers longer than the filaments, oblong. Hypogynous glands 2, alternating with the 2 ovaries. Ovaries 2, elongate, with many ovules in each; style usually thickened at the apex and terminated with a reflexed cup-shaped membrane; stigma conical or cylindrical, with a shortly 2-lobed thick apex. Follicles paired, elongate-cylindrical, many-seeded. Seeds cylindrically oblong, truncate at both ends, granular-tubercled. Albumen fleshy. Embryo central with ovate cotyledons.—Herbs or undershrubs or shrubs, with opposite entire leaves. Flowers often showy, solitary in the axils of the leaves, the glands usually at the base of the leaves and of the calyx-lobes.

1. **V. rosea,** L.—*Thin-baw-ma-nyo-pan.*—An evergreen branched undershrub, 1-3 ft. high, all parts more or less minutely puberulous; leaves obovate-oblong, tapering at the base, on a slender, 2-3 lin. long, puberulous petiole, blunt or rounded with a mucro, 1-2 in. long, entire, firmly membranous; flowers showy, rose-coloured or white with a deep rose-coloured throat, very shortly pedicelled, solitary in the axils of the leaves; calyx puberulous, the lobes linear-subulate; corolla-tube puberulous, about an inch (in small-flowered varieties often only $\frac{1}{3}$ in.) long, the lobes broad, somewhat shorter than the tube; follicles cylindrically linear, 1-1$\frac{1}{2}$ in. long, striate, sparingly puberulous.

Hab.—A South American plant, now frequently cultivated in native gardens and occasionally domesticated in rubbishy places around villages.—Fl. Jan.-May.

CALPICARPUM, G. Don.

Calyx 5-parted, the lobes lanceolate, persistent, glandular at the apex. Corolla salver-shaped, dextrorsely twisted in bud, with a narrow tube inflated at the apex, the throat pilose, without scales. Stamens 5, inserted in the inflated part of the corolla-tube; anthers sagittate. Ovaries 2, each with 1 or 2 ovules, alternating with 2 hypogynous subulate scales; stigma large, 2-lobed at the summit. Follicles paired or by abortion solitary, obliquely truncate at the apex, half-2-valved, 1-celled, with a thin coriaceous pericarp. Seeds solitary, ovoid-oblong. Albumen none. Embryo with a superior ovate radicle and large cotyledons conform with the shape of the seed.—Shrubs or trees, with opposite entire leaves. Flowers showy, in terminal, almost sessile, small corymbs.

1. **C. Roxburghii,** G. Don.—*Sa-lap.*—An evergreen large shrub, all parts glabrous; leaves from elliptical to oblong and lanceolate, tapering in a very short petiole, 3-5 in. long, shortly and bluntish acuminate, entire, chartaceous, glabrous and glossy; flowers showy, rose-coloured, on short thick pedicels, forming a rather dense, much bracted, short, sessile or shortly peduncled corymb at the end of the branches; bracts short, ovate, acute; calyx glabrous, about a line long; corolla-tube an inch long or longer; follicles usually solitary by abortion, compressed urn-shaped, with an obliquely truncate apex, minutely tomentose, about $\frac{1}{2}$-$\frac{2}{3}$ in. long.

Hab.—In the tropical forests above Rangoon and from Martaban down to Tenasserim.—Fl. Aug.-Dec.

PLUMIERIA, Tournef.

Calyx 5-parted, the lobes rounded. Corolla funnel-salver-shaped, sinistrorsely twisted in bud, the tube straight or curved

without appendages at the throat. Stamens 5, inserted at the base of the tube; anthers oblong, dilated at the base, longer than the filaments. Ovaries 2, ovoid, immersed in the disk, many-ovuled; style single, with an oblong stigma 2-cleft at the apex. Follicles paired, oblong or linear, rarely ventricose, usually deflexed, many-seeded. Seeds oblong, compressed, sometimes membranously winged. Albumen none. Embryo with large, broad, leafy cotyledons.—Small fleshy milky trees, with alternating or crowded leaves. Flowers large, arranged in terminal cymose corymbs.

1. **Pl. acutifolia,** Poir.; Brand. For. Fl. 323.—*Ta-yop-sa-gah.*—A tree (15—25+4—5+2—3), leafless in H.S., all parts glabrous; bark smooth, grey; leaves from oblong to almost obovate-lanceolate, ½-1½ ft. long, tapering in a 1-2 in. long petiole, shortly acuminate, entire, glabrous, parallel-nerved, the nerves uniting into a marginal one; flowers large, showy, white, with citroon-yellow centre, sometimes somewhat rose-coloured outside, on 2-4 lin. long thick pedicels, forming a robust, long-peduncled, glabrous, cymose corymb at or near the end of the thick branchlets; corolla-tube about ⅓ in. long, the lobes nearly twice as long; follicles linear, cylindrical, diverging, about 5 in. long, glabrous.

Hab.—Of American origin, now very frequently seen in gardens and villages all over Burma.—Fl. March-Apr.

BEAUMONTIA, Wall.

Calyx 5-parted, the lobes leafy, glandular inside at the base. Corolla bell-shaped or rotate-bell-shaped, twisted in bud, narrowed in a very short tube, without scales at the throat. Stamens 5, inserted at the summit of the corolla-tube; filaments filiform; anthers elliptical, sagittate, cohering in a cone round the stigma. Nectary consisting of 5 fleshy blunt glands. Ovary 2-celled, immersed in the torus, each cell with numerous ovules; style filiform, the stigma oblong, obsoletely 2-lobed at the summit. Fruit consisting of 2 connate follicles, oblong, woody-coriaceous, when fully ripe separating. Seeds numerous, pendulous, imbricate, obovoid-oblong, with a crown of long silky hairs at the hilum. Albumen fleshy. Embryo with oblong cotyledons.—Scandent shrubs, with opposite leaves. Flowers usually large and showy, in terminal raceme-like corymbs.

1. **B. grandiflora,** Wall.—An evergreen, large, scandent shrub, the young parts densely and shortly velvety-tomentose; leaves from obovate- to elliptically-oblong, acute or obtuse at the base, on a ½ to nearly ¾ in. long glabrescent petiole, 6-9 in. long, blunt or apiculate, entire, chartaceous, shortly and softly pubescent while young, adult glabrous; flowers very large and showy, yellowish white, on

½-1 in. long, shortly tomentose, robust pedicels, forming a shortly peduncled, shortly tomentose, raceme-like corymb at the end of the branchlets; calyx-lobes about an inch long or somewhat longer, obovate-lanceolate, acute or acuminate, velvety-tomentose; corolla about 3 in. long, campanulate funnel-shaped, puberulous outside, the lobes short and broad, acute; follicles horizontally diverging, linear, with incurved blunt points, pretty smooth, as thick as the little finger, 6-10 in. long.

Hab.—Chittagong hills.—Fl. D.S.

PARSONSIA, R. Br.

Calyx almost 5-parted, the lobes without glands or with an irregular ring of minute glands inside at the base. Corolla-tube cylindrical or nearly globular, the throat without scales, the lobes spreading, twisted in bud. Stamens inserted at or below the middle of the tube, the filaments often twisted under the anthers, the latter oblong, lanceolate or linear, wholly or partially exserted, cohering in a cone or ring round the stigma, the cells with a rigid basal lobe destitute of pollen. Hypogynous scales 5, as long as the ovary, free or united in a folded ring. Ovary 2-celled, with numerous ovules in each cell; stigma surrounded by a ring or membranous expansion at the base, usually 2-lobed. Fruit elongated, nearly terete, separating more or less completely into 2 follicles. Seeds with a crown of long silky hairs at the hilum.—Twining shrubs, with opposite leaves. Flowers small, in terminal or axillary corymbose cymes; bracts small.

1. **P. spiralis**, R. Br.—An evergreen twining shrub, all parts glabrous; leaves oblong to elliptical, rounded or acute, and often somewhat unequal at the base, on a ½-1 in. long petiole, 3-5 in. long, shortly acuminate, entire, glabrous, firmly membranous or thin-coriaceous; flowers small, yellowish, on 2-3 lin. long pedicels, forming a 2-3-chotomous, glabrous, corymb-like cyme on a long slender peduncle in the axils of the leaves; calyx minutely and indistinctly puberulous; corolla-lobes linear, about 2-3 lin. long, longer than the short tube; follicle cylindrically linear, somewhat compressed, about 5 in. long, acuminate, glabrous.

Hab.—Pegu, above Rangoon; Tenasserim.—Fl. Apr.

VALLARIS, Burm.

Calyx 5-parted, the lobes lanceolate, the inner ones usually gland-bearing at the base. Corolla-tube short, the throat without scales, the lobes large and broad, dextrorsely twisted in bud. Stamens inserted in the upper part of the corolla-tube; filaments

ligulate, pilose; anthers sagittate, cohering in a cone. Nectary cup-shaped, 5-cleft or -parted. Ovary single, 2-celled, each cell with many ovules; style filiform; stigma annular at the base, the apex conically ovate. Follicle solitary, 2-celled, oblong to ovate-oblong, opening into 2 valves. Seeds obovoid-compressed, terminated by a tuft of long silky hairs. Albumen scanty; embryo straight, with leafy elliptical cotyledons.—Twining shrubs, with opposite leaves; flowers fragrant, in axillary racemes or racemose cymes.

1. **V. dichotoma,** Wall.; Brand. For. Fl. 327. — A large twining shrub, the young shoots and very young leaves softly puberulous; leaves oblong to obovate-oblong, acute at the base, on a glabrous or puberulous petiole 3-4 lin. long, 2-4 in. long, acute or sharply apiculate, firmly membranous, entire, while young puberulous, adult glabrous or scabrous and minutely puberulous beneath; flowers showy, white, on slender 4-5 lin. long puberulous pedicels, forming a simple or 2-forked greyish puberulous peduncled raceme-like cyme in the axils of the leaves; corolla bell-shaped rotate with a very short tube; anthers cohering in a cone; follicle solitary, 4-5 in. long, elongate-oblong, rather acute, 2-valved, glabrous; hair-crown of seeds an inch long or longer.

Var. 1, **glabra:** all parts glabrous.

Var. 2, **pubescens:** all softer parts puberulous, adult leaves beneath scabrous and minutely puberulous.

Hab.—Frequent in the dry, especially the mixed dry, forests of the Prome district.—Fl. Fr. March.—l.—SS.=CaS.

HOLARRHENA, R. Br.

Calyx almost 5-parted, the lobes lanceolate, all or only the inner ones with 1 or 2 glands at each side, or glandless. Corolla salver-shaped, twisted in bud, the tube dilated above the base, the throat naked and contracted. Stamens inserted in the dilated part of the corolla-tube; filaments slender, but very short; anthers lanceolate, apiculate. Nectary none. Ovaries 2, ovate, many-ovuled; stigma oblong simple, abruptly acuminate. Follicles by pairs, linear. Seeds pendulous, oblong-spindle-shaped, terminating in a crown of silky hairs. Albumen none. Embryo with cordate cotyledons and a superior radicle.—Small trees or shrubs, with opposite leaves. Flowers in terminal corymb-like cymes.

All parts (also the inflorescence) shortly velvety-pubescent . . *H. codaga.*
All parts (also the inflorescence) glabrous . . . . *H. antidysenterica.*

1. **H. Codaga,** G. Don.—*Let-top-thein.*—A tree (15—20 + 8—12 + 2—3), shedding leaves during H.S., all parts more or less

velvety-pubescent; leaves elliptically oblong to oblong-lanceolate, acute or obtuse at the base, on an 1-2 lin. long pubescent petiole, 4-6 in. long, acute or apiculate, entire, chartaceous, while young on both sides velvety pubescent, turning scabrescent above; flowers middling-sized, on ½-1 in. long pedicels, forming a lax, shortly pubescent, short-peduncled, corymb-like cyme in the axils of the terminal leaves; calyx and corolla-tube shortly pubescent; follicles paired, linear, up to a foot long, smooth, whitish spotted.

Hab.—Not unfrequent in the drier upper mixed forests from Chittagong and Ava down to Pegu and Arracan.—Fl. March-Apr.; Fr. C.S.—s. + l.—SS.× SiS.

2. **H. antidysenterica,** Wall.; Bedd. Sylv. Madr. 140, t. 20, f. 6; Brand. For. Fl. 326, t. 40.—*Let-top-gyee.*—A leaf-shedding tree (25—30 + 4—6 + 2—3), all parts quite glabrous; bark grey, peeling off in irregular, rounded, rather corky pieces; cut pale-coloured, milky; leaves elliptical to oblong, obtuse at the base, on a 2-3 lin. long, glabrous petiole, 4-6 in. long, shortly acuminate, chartaceous, entire, glabrous; flowers middling-sized, white, on 3-7 lin. long glabrous or sparingly puberulous pedicels, forming a sessile or nearly sessile, glabrous, lax cyme above the axils of the leaves or at the end of the young axillary shoots; calyx glabrous; corolla-tube puberulous; follicles paired, linear, 1-1¼ in. long, glabrous, usually without white spots.

Hab.—Not unfrequent in the dry and open forests from Chittagong, Prome, and Pegu down to Tenasserim.—Fl. March-Apr.; Fr. C.S. l.—SS.=CaS. Dil.

Remarks.—Yields the bark of commerce.

ALSTONIA, R. Br.

Calyx 5-parted, without or with very minute glands. Corolla salver-shaped, twisted in bud, the cylindrical tube more or less swollen round the anthers, the throat without scales. Stamens inserted at the middle or higher up in the corolla-tube; filaments very short; anthers oblong-lanceolate, cordate at the base. Nectary none or rudimentary; ovary consisting of 2 distinct carpels united by the style, each carpel with numerous ovules; stigma ovoid or conical. Follicles by pairs, long, linear; seeds compressed, peltately attached, all round bordered with silky hairs, of which those at each end usually very long. Albumen scanty. Embryo with oblong flat cotyledons and a superior radicle.—Trees or rarely shrubs, with parallel-veined leaves whorled by 3 or more or rarely opposite. Flowers small, in terminal corymb-like cymes usually solitary in the axils of the uppermost leaves. Bracts small.

Inflorescence densely puberulous or glabrous . . . . *A. scholaris.*
Inflorescence quite glabrous . . . . . *A. spectabilis.*

1. **A. scholaris,** R. Br.; Bedd. Sylv. Madr., t. 242; Brand. For. Fl. 325.—*Let-tope.*—An evergreen tree (50—60 + 15—20 + 4—6), all parts glabrous or the young shoots obscurely pubescent; bark ⅓ in. thick, longitudinally reticulate-fissured, otherwise smooth, grey; cut milky, greenish; leaves obovate-oblong to elliptical and obovate, acute at the base and decurrent on the strong 3-5 lin. long petiole, 4-7 in. long, blunt or bluntish acuminate, entire, thin-coriaceous, glabrous, or obscurely puberulous on the glaucous under-surface; flowers rather small, on about a line long puberulous pedicels, forming an umbellate compound puberulous panicle at the end of the branches, the panicles sessile with as many floral branches as leaves or appearing ample and peduncled from the reduction of the uppermost leaf-whorl into small floral leaves; calyx and corolla puberulous, the tube of the latter about 3-4 lin. long, very villous at the throat; follicles paired, thin and slender, about 1-1½ ft. long, glabrous.

Hab.—Not unfrequent in the leaf-shedding, especially the open and dry, forests, from Prome and Martaban down to Tenasserim.—Fl. Oct.-Sept.—l.—SS.=CaS. Lat. Metam.

Remarks.—Wood white or pale-coloured, light, close-grained, but rather coarse, very perishable and soon attacked by xylophages. Used for light work, such as boxes, trunks, scabbards, writing-boards, &c. It is as bitter as gentian, and the bark is said to be a powerful tonic.

2. **A. spectabilis,** R. Br.—A large evergreen tree (80—100 × 50—60 × 6—7), all parts quite glabrous; leaves obovate-oblong to oblong, acute or obtuse at the base, very shortly and stoutly petioled, retuse or rounded, 4-7 in. long, coriaceous, glabrous, glaucous beneath, the lateral nerves thin, parallel and numerous; flowers small, white, very shortly and stoutly pedicelled, densely cymulose or almost clustered, the cymelets shortly peduncled, whorled and forming a long-peduncled glabrous panicle arising from the axils of the whorled upper leaves; follicles linear.

Hab.—Tropical forests of the Andamans.—s.—SS.=SiS., etc.

URCEOLA, Roxb.

Calyx 5-parted, the lobes blunt, without glands. Corolla tubular, the tube short, the throat without scales, lobes hardly imbricate in bud. Anthers hastate. Disk cupular or annular, truncate or shortly 5-lobed. Ovaries 2; stigma oblong, at the base without a ring. Follicles paired, ovoid-oblong, coriaceous or almost woody. Seed compressed-oblong, silk-hairy, terminated by 2 very unequal crowns of hairs, the outer one short and formed simply by the

continuation of the indument of the testa, the inner proper one consisting of soft silky hairs.—Scandent milky shrubs, with opposite leaves. Flowers minute, in peduncled corymblike panicles or corymbs at the end of the branchlets and in the axils of the upper leaves.

1. **U. esculenta,** Bth. (*Chavannesia esculenta,* DC.).—An evergreen, large, scandent shrub, all parts glabrous; leaves elliptical to elliptically oblong, rounded or obtuse at the base, on a ½-⅔ in. long petiole, 3-5 in. long, very shortly acuminate, entire, thin but firmly coriaceous, glabrous, very glossy above; flowers minute, white; corymbs apparently short, glabrous, long-peduncled and brachiate in the axils of the upper leaves or terminal; follicles paired, elongate-ovoid-oblong, truncate-acuminate, tapering in a thick about ½ in. long stalk, 3 in. long, glabrous, fleshy-coriaceous, edible; seeds tawny silk-hairy, with a very long, white, silky crown.

Hab.—Tenasserim; according to Mr. G. W. Strettell common all over Pegu.—Fr. close of R.S.

Remarks.—Yields caoutchouk said to be equal to the genuine one.

EPIGYNUM, Wight.

Calyx tubular, 5-cleft, the lobes without glands. Corolla salver-shaped, 5-lobed, dextrorsely twisted in bud, the throat without scales. Stamens 5, inserted near the base of the corolla-tube; anthers sagittate, adhering to the stigma. Hypogynous disk fleshy, embracing the base of the style and covering the summit of the ovary. Ovary adherent to the calyx-tube, 2-celled, the cells with numerous ovules; style filiform; stigma pyramidal, acute, slightly winged, furnished at the base with a short reflexed membrane.—Climbing shrubs, with opposite leaves. Flowers in axillary corymbs.

1. **E. Griffithianum,** Wight.—A spreading climbing shrub, all parts glabrous; leaves elliptical or ovate-elliptical, shortly petioled, almost blunt, entire, glabrous; flowers numerous, crowded, along with the peduncle and the pedicels clothed with appressed hairs, in axillary corymbs shorter than the leaves; calyx-lobes ovate, acute; corolla before expansion ventricose at the base and apex, 3 to 4 times longer than the calyx.

Hab.—South Tenasserim.

ICHNOCARPUS, R. Br.

Calyx 5-cleft, the lobes alternating with solitary or paired minute lanceolate glands inside. Corolla salver-shaped, twisted in bud, the tube dilated above the middle, the throat without scales,

callose and constricted. Stamens inserted in the inflated part of the corolla-tube; filaments very short, filiform; anthers sagittate, without appendages. Nectary consisting of 5 capitate threads. Ovaries 2, appressed, ovate, each with many ovules; stigma ellipsoid, abruptly and long-acuminate, minutely 5-glanded at the middle. Follicles paired, slender. Seeds numerous, with a crown of long silk-hairs at the apex.—Scandent shrubs, with opposite leaves. Flowers small, in terminal and axillary cymose panicles.

1. **I. frutescens,** R. Br.; Brand. For. Fl. 327.—*Tau-sa-pai.*—An evergreen scandent shrub, the young parts more or less covered with a rusty-coloured appressed pubescence; leaves elliptical to obovate-oblong and broadly lanceolate, acute or obtuse at the base, on a pubescent and glabrescent petiole 2-3 lin. long, 2-4 in. long, bluntish to acuminate with a mucro, entire, firmly membranous or thin-coriaceous, glabrous or nearly so or pubescent and glabrescent above; flowers small, white, on short rusty-pubescent pedicels, in peduncled small cymes arranged in a brachiate rusty-pubescent panicle in the axils of the leaves and at the end of the branchlets; calyx about ½ a line long; corolla glabrous outside, villous at the throat, the tube about a line long or somewhat longer; follicles paired, slender, sometimes (like *Ecdysanthera*) moniliform inflated, 2-3 in. long, glabrous or while young appressed-pubescent.

Var. 1, **frutescens proper:** leaves and follicles glabrous.

Var. 2, **pubescens:** leaves, especially while young, on both sides appressed rusty-pubescent, glabrescent above; young follicles similarly pubescent.

Hab.—Frequent in the leaf-shedding forests, especially in the mixed ones and the savannahs, all over Burma; var. 2: chiefly in the dry forests of Ava and Prome.—Fl. C.S.; Fr. H.S.—l.—SS.= ∞.

AGANOSMA, G. Don.

Calyx 5-parted, gland-bearing inside, the segments elongate-lanceolate. Corolla salver-shaped, twisted in bud, the cylindrical tube short, the throat without scales. Anthers sessile, inserted in the lower part of the corolla-tube, lanceolate, acuminate. Nectary cup-shaped or cylindrical, 5-lobed or crenate. Ovaries 2, blunt, united by the style, many-ovuled; stigma spindle-shaped or cylindrical, acuminate, entire or 2-lobed. Follicles paired, elongate, terete, woody-coriaceous. Seeds linear- or oblong-obovate, compressed, terminated by a crown of long silky hairs. Albumen scanty. Embryo with leafy cotyledons and a short superior radicle.—Shrubs, usually scandent, with opposite leaves. Flowers

in peduncled or almost sessile cymes or corymbs at the end of the branches or of the axillary branchlets.

Calyx nearly an in. long, tawny-velvety ; nerves of leaves impressed *A. calycina.*
Calyx only 2-3 lin. long, glabrous ; nerves of leaves prominent beneath and arcuately uniting towards the margin . . *A. marginata.*

1. **A. calycina,** Don. — An evergreen scandent shrub, the young shoots shortly pubescent; leaves elliptical to elliptically obovate, rounded at the base, shortly acuminate, on a 3-5 lin. long puberulous petiole, 2-3 in. long, chartaceous, glabrous, or somewhat pubescent along the midrib beneath, the nerves impressed; flowers conspicuous, white, forming a terminal, tawny-pubescent, dichotomous cyme ; bracts linear-lanceolate, acuminate, tawny and shortly tomentose; calyx-segments nearly an inch long, tawny-velvety, linear, subulate-acuminate; corolla-tube and righthand halves of lobes shortly pubescent, the tube shorter than the calyx; ovary glabrous.

Hab.—Tenasserim.—Fl. Sept.

2. **A. marginata,** G. Don.—An evergreen, large, scandent or spreading shrub with twisted stems nearly ½-1 ft. in girth, all parts glabrous or the young shoots pubescent; bark 2-3 lin. thick, very rough; leaves from oblong to oblong-lanceolate, acute or rounded at the base, on a 2-3 lin. long shortly pubescent or glabrous petiole, 1-3 in. long, apiculate or shortly and bluntish acuminate, entire or nearly so, thick membranous, glossy above, more or less pale-coloured beneath, glabrous, or beneath puberulous or scabrous along the prominent nerves which arcuately unite towards the margin; flowers white, on 1½-2 lin. long pedicels, forming terminal and axillary, shorter or longer peduncled, glabrous or slightly puberulous cymes; calyx-segments ovate-lanceolate, 2-3 lin. long, glabrous; corolla glabrous, the lobes longer than the tube; follicles paired, cylindrical, thin, about 1-1½ ft. long, glabrous.

Hab.—Frequent in the open and lower mixed forests from Ava and Martaban down to Tenasserim; also Chittagong.—Fl. March-Apr.; Fr. the next year.—l.—SS.=∞. *Dil.*

Remarks.—Wood rather light, coarsely fibrous, rather close-grained, soft pale-coloured or white.

CHONEMORPHA, Don.

Calyx 5-cleft, tubular-funnel-shaped, with a ring of glands at the bottom, the lobes acuminate. Corolla salver-funnel-shaped, twisted in bud, the throat without scales. Anthers almost sessile, inserted below the middle of the tube, sagittate, acuminate, cohering in a cone round the stigma. Nectary cup-shaped, thick, entire or obscurely crenulate. Ovaries 2, oblong, united by the style,

many-ovuled; stigma oblong, 2-toothed, annular at the base. Follicles elongate, linear, acuminate. Seeds obovate-oblong, terminated by a crown of long silky hairs. Albumen scanty. Embryo with oblong cotyledons.—Scandent shrubs, with ample opposite leaves. Flowers large, in peduncled terminal cymes.

1. **Ch. macrophylla,** Don.; Brand. For. Fl. 328.—An evergreen, large, scandent shrub, the younger parts more or less shortly and softly pubescent or almost tomentose; leaves very ample, obovate to elliptically obovate, rounded or almost cordate at the narrowed base, on a ½ to 2 in. long pubescent petiole, 5-7 in. long by 4-5 broad, acute or apiculate, firmly membranous, above glabrous or slightly pubescent along the nerves, beneath more or less shortly pubescent and pale-coloured; flowers large, 2-3 in. across, white or rarely pale rose-coloured, on 3-5 lin. long shortly tomentose or canescent pedicels, forming a peduncled, dichotomously branched, canescent cyme at the end of the branches; bracts ovate, acute; corolla variable in size, the tube ⅔ to 1⅓ in. long, the lobes somewhat longer and broad; follicles united into one 1-1¼ in. long, linear, acuminate, glabrous.

Hab.—Frequent in the tropical forests along choungs of the Andamans (only the small-flowered variety seen).—Fl. May.—s: l.—SS.=SiS. Metam.

Remarks.—According to Revd. Parish, this yields a considerable quantity of caoutchouk.

CERCOCOMA, Miq.

Calyx 5-cleft or -parted, the tube bell-shaped, with numerous truncate glands inside at the base, the lobes oblong. Corolla salver-shaped, with a cylindrical tube, twisted in bud, the throat without scales. Stamens 5; filaments adnate to the base of the corolla-tube; anthers hastate, cohering in a cone round the stigma. Nectary cup-shaped, 5-cleft. Ovaries 2, united by the style, many-ovuled. Follicles paired, elongate, compressed, many-seeded. Seeds compressed, obovate, narrowed in a slender neck crowned by a coma of long silky hairs. Albumen none. Embryo straight, with oblong cotyledons and a short superior radicle.—Scandent or climbing shrubs, with opposite leaves. Flowers in slender, lax, axillary cymes.

1. **C. Wallichii,** Miq.—An evergreen, lofty, scandent shrub, all parts glabrous; leaves oval to elliptically ovate, rounded or acute at the base, on a ½-1 in. long slender petiole, 2-4 in. long, acuminate, entire, firmly membranous, glabrous; flowers white with a deep crimson throat, conspicuous, on 3-4 lin. long minutely puberulous pedicels, forming a pretty long-peduncled, minutely puberulous, glabrescent, dichotomous cyme in the axils of the upper leaves; calyx nearly to the base 5-cleft, almost glabrous; corolla-tube

about 3 lin. long, the lobes twice as long or somewhat longer, glabrous or more or less puberulous on the inner face; follicles paired or rarely connate, 1-1¼ ft. long, glabrous.

Hab.—Not unfrequent in the tropical forests of Martaban down to Tenasserim, rare along the eastern slopes of the Pegu Yomah; also Ava.—Fl.-Apr.—s: l.—SS.=*Metam.* SiS.

ANODENDRON, A. DC.

Calyx 5-parted, the lobes ovate, with minute glands inside at their bases. Corolla salver-shaped with a short tube, twisted in bud, the throat without scales, usually somewhat pubescent above the stamens, the lobes sigmoid-falcate. Anthers sessile, inserted in the inflated part below the middle of the corolla-tube, sagittate, apiculate, cohering in a cone round the stigma. Nectary cup-shaped, obscurely 5-crenate. Ovaries 2, as long as the nectary, each with a few ovules only; style very short; the stigma ovoid, acute, 2-toothed or -lobed, at the base surrounded by a reflexed membrane. Follicles paired, diverging, ovoid-attenuate, woody-coriaceous. Seeds compressed, obovate, tapering in a long neck terminated by a crown of long silky hairs. Embryo axile in the albumen, with flat almost cordate cotyledons and a short superior radicle.—Scandent shrubs, with opposite leaves. Flowers small, in axillary and terminal, peduncled, corymbose panicles or cymes.

1. **A. paniculatum,** A. DC.—*Twin-nek.*—An evergreen, large, scandent shrub, all parts quite glabrous; leaves elliptical to elliptically oblong, acute at the base, on a strong petiole 5-8 lin. long, 3-5 in. long, apiculate, entire, thin-coriaceous, glabrous, the nerves beneath regularly parallel; flowers small, white, on a line long or shorter pedicels, cymose, forming more or less, ample, glabrous, corymbose panicles in the axils of the upper leaves and larger ones at the end of the branches; calyx minute; corolla-tube hardly half a line long, the lobes linear, more than twice the length of the tube; follicles paired, elongate-ovate, blunt, woody-fibrous, 3-4 in. long, glabrous.

Hab.—Not unfrequent in the tropical forests of the Pegu Yomah, Martaban and Tenasserim, especially along choungs.—Fl. Jan.-Feb.; Fr. the following year.—s: l.—SS.=*Metam.* SiS.

Remarks.—The Andamanese use the fibre for the strings of their bows, and Mr. Homfray considers it stronger than any known to him.

ECDYSANTHERA, Hook. and Arn.

Calyx small, 5-cleft or -parted, with a few or without glands at the base inside. Corolla almost urn-shaped, naked at the throat,

the tube ovoid-bell-shaped; limb 5-lobed, the lobes short, slightly dextrorsely twisted. Stamens inserted at the base of the corolla; anthers almost sessile, sagittate, connivent round the stigma, the cells at the base produced into empty tails. Disk annular, entire or 5-lobed. Ovary-carpels 2, distinct, with numerous ovules; style short, the stigma ovoid or oblong. Follicles divaricate, continuous, usually few-seeded. Seeds compressed, somewhat contracted at the apex and crowned by a long caducous coma and a persistent ring of short pairs. Albumen scanty.—Scandent shrubs, with opposite penninerved leaves. Flowers small, white or rose-coloured, in lax trichotomous cymes often panicled.

1. **E. brachiata,** DC.—A large evergreen scandent shrub, all parts glabrous, the branchlets lenticellate; leaves oblong to ovate-oblong, obtuse or acute at the base, on a 3-4 lin. long petiole, shortly and usually abruptly acuminate, 3-5 in. long, chartaceous, glabrous, opaque; flowers small, white (?), on slender about 2 lin. long pedicels, cymose and forming long-peduncled, brachiate, glabrous panicles in the axils of the leaves and usually shorter than them; calyx minute, glabrous; corolla barely a line long; follicles narrowly lanceolate, about 2-2½ in. long, acuminate, glabrous and smooth; seeds nearly ½ in. long, tapering upwards, the deciduous coma 1-1½ in. long.

Hab.—Ava hills.

PARAMERIA, Bth.

Calyx 5-parted, glandular at the base inside. Corolla campanulate-salver-shaped, sinistrorsely twisted in bud, the throat without scales. Stamens inserted at the base of the corolla-tube and included; filaments very short; anthers sagittate-oblong, cohering in a cone round the stigma. Nectary 5-lobed. Ovaries 2, hardly longer than the nectary, many-ovuled; style short; stigma conically capitate. Follicles elongate, slender, inflated at intervals and somewhat moniliform. Seeds terminated by a crown of long silky hairs.—Scandent shrubs, with opposite leaves. Flowers small, in terminal or axillary usually trichotomous cymes or corymbs.

1. **P. glandulifera,** DC.—An evergreen, large, scandent shrub, all parts glabrous; leaves oblong- to obovate-lanceolate, on a very short petiole not exceeding a line, acute at the base, 2-3 in. long, shortly and rather abruptly bluntish acuminate, entire, chartaceous, glabrous; flowers small, on nearly a line long pedicels, forming a short-peduncled, glabrous, dichotomous corymb in the axils of the upper leaves and at the end of the branchlets; calyx-lobes oval, blunt; corolla glabrous; follicles slender, moniliform, 6-8 in. long, glabrous.

Hab.—Not unfrequent along the borders of the tidal forests of the coast of the Andamans; also Tenasserim.—Fr. March-Apr.

POTTSIA, Hook. and Arn.

Calyx 5-parted, the lobes with 1 or 2 glands at each side at the base. Corolla salver-shaped, twisted in bud, the throat without scales. Filaments inserted at the throat and decurrent to below the middle of the corolla-tube; anthers exserted, hastate, rather acute, at the base produced into 2 tails, cohering in a cone round the stigma. Nectary consisting of 5 linear-lanceolate glands. Ovaries 2, obovoid, many-ovuled; style filiform; stigma ovoid, 5-cornered, acute, entire. Follicles elongate, thin, terete, at the apex cohering for some time. Seeds compressed, with a crown of long silky hairs.—Scandent shrubs, with opposite leaves. Flowers small, in very lax, trichotomous, terminal or axillary corymbs or panicles.

1. **P. Cantoniensis,** Hook. and Arn.—An evergreen climbing shrub, the young shoots minutely puberous; leaves ovate to elliptically ovate, acute or obtuse at the base, on a $\frac{1}{2}$-$\frac{3}{4}$ in. long minutely puberous petiole, 2-3 in. long, shortly acuminate, entire, firmly membranous, glabrous or obsoletely puberous along the midrib beneath; flowers rather small, rose-coloured, on 3-4 lin. long puberous or almost glabrous pedicels, forming a lax corymbose panicle at the end of the branches and long-peduncled brachiate corymbs in the axils of the leaves; corolla glabrous, about 3 lin. long, the lobes about half as long as the tube, ovate; hypogynous lobes lanceolate, longer than the ovaries.

Hab.—Tenasserim.

STROPHANTHUS, DC.

Calyx 5-parted, with a few glands at the base inside. Corolla funnel-shaped, with a shorter or longer tube, the lobes twisted in bud, broad at the base, and longer or shorter cordate-acuminate, at the throat bordered by membranous lobes or scales, each produced into 2 longer or shorter segments. Stamens inserted at the lower part of the corolla-tube; filaments linear, adnate to the tube; anthers sagittate-linear, mucronate or long-bristled. Nectary none. Ovaries 2, almost globular, many-ovuled; style strong, with an angular or cylindrical stigma. Follicles paired, divaricate, woody-coriaceous, many-seeded. Seeds compressed, terminated by a crown of long silky hairs.—Shrubs, usually scandent, with opposite leaves. Flowers often conspicuous, in dichotomous or trichotomous terminal cymes or corymbs.

× Corolla-lobes acute or acuminate, but not produced into long tails.

Floral bracts ovate, acute, stiff, only 1½ lin. long . . . . *S. brevicaudatus.*

× × Corolla-lobes produced into tails 2 or more inches long.

○ Floral bracts and the conform calyx-lobes stiff, linear-subulate.

Corolla (without the tails) about an inch long . . . . *S. Griffithii.*

Corolla (without the tails) about ½ an inch long . . . . *S. longicaudatus.*

○ ○ Floral bracts and the conform calyx-lobes flaccid, reflexed, linear.

Corolla about ⅔ in. long; bristles twice as long as the anthers . *S. caudatus.*

1. **S. brevicaudatus,** Wight.—A spreading glabrous shrub; leaves elliptical to elliptically ovate, acute at the base, on a 2-3 lin. long slender petiole, 2-4 in. long, rather abruptly acuminate, waved, firmly membranous, glabrous; flowers small, on about a line long pedicels, forming a dichotomously branched, small-bracted, glabrous, short-peduncled cyme at the end of the branches; bracts small, ovate, bristly acuminate; corolla hardly ½ an in. long, the lobes ovate, somewhat longer than the tube, acute (but not caudate); scales large, membranous, 2-cleft, the lobes linear; anthers with short bristles; style villous.

Hab.—A Malacca plant said to grow at Mergui.

2. **S. Griffithii,** Wight.—A large scandent shrub, all parts glabrous; leaves obovate to oblong-obovate, acute at the base, 2-4 in. long, on a 2-3 lin. long petiole, apiculate to shortly and abruptly acuminate, entire, thin-coriaceous, glabrous; flowers conspicuous, white, with purple streakes and spots, on a line long glabrous pedicels, forming a small, dichotomous, glabrous cyme at the end of the branchlets; bracts 1-1½ lin. long, stiff, linear-subulate; calyx-lobes linear-subulate; corolla about an inch long, the lobes produced into 2½-3 in. long tails; scales membranous, broad, 2-cleft to the base, the lobes acuminate; follicles paired, elongate-ovate, nearly a foot long, fibrous-coriaceous, glabrous.

Hab.—Upper Tenasserim.

3. **S. longicaudatus,** Wight.—A large scandent shrub, all parts glabrous; leaves elliptical to elliptically oblong, acute at the base, on an 1-2 lin. long petiole, 2-3 in. long, shortly and rather abruptly acuminate, entire, firmly membranous, glabrous; flowers rather conspicuous, on very short and thick pedicels, forming a poor, short, glabrous, dichotomous cyme at the end of the young branchlets; bracts about 2-2½ lin. long, linear-subulate; calyx-lobes linear-subulate; corolla about ½ in. long, greenish-yellow, the throat red-streaked, the lobes produced into linear 2-3 in. long tails; scales membranous, broad, white, red-streaked, 2-cleft to the base, the lobes acuminate; anthers somewhat shorter than the bristles.

Hab.—Lower Tenasserim.

4. **S. caudatus** (*Echites caudatus*, Burm.).—A large scandent shrub, all parts glabrous; leaves oblong to elliptical, tapering on a 3-4 lin. long petiole, 2-4 in. long, shortly and often bluntish acuminate, entire, glabrous, firmly membranous; flowers rather conspicuous, rose-coloured, with yellowish tails, on 1-2 lin. long pedicels, forming a lax, dichotomous, glabrous, longer or shorter peduncled cyme at the end of the branches or terminating the young branchlets; bracts all linear, 3-4 lin. long, membranous, flaccid and reflexed; calyx-lobes conform with the bracts and similarly reflexed; corolla about $\frac{2}{3}$ in. long, the lobes produced into $1\frac{1}{2}$-2 in. long tails; scales linear, acuminate; anthers shorter than the soft deciduous bristles.

Hab.—Tenasserim.—Fl. Jan.

WRIGHTIA, R. Br.

Calyx 5-parted, with 5 to 10 broad scales at the base inside. Corolla rotate-salver-shaped, with a cylindrical usually short tube, twisted in bud, the throat with a crown of 5 or 10 scales either distinct or united in a ring. Stamens inserted at the throat; filaments very short and broad; anthers sagittate, exserted, cohering in a cone round the stigma. Hypogynous disk or scales none. Ovary of 2 carpels distinct or connate, but readily separable, many-ovuled. Follicles paired, connate and marked by 2 lateral furrows. Seeds numerous, oblong, with a crown of hairs at one end.—Trees or shrubs, milky, with opposite leaves. Flowers often showy, in terminal or spuriously axillary corymb-like cymes. Bracts small.

* Throat of corolla furnished with scales or fringes.
× All parts, especially the leaves, shortly and densely pubescent.
Corolla-lobes broad; scales of throat cuneate, 2-3-lobulate . *W. mollissima.*
×× All parts glabrous.
Corolla white, the lobes linear-oblong, the throat fringed by a ring of branched, long, filiform scales . . . . *W. tinctoria.*
Corolla red, the lobes broad; scales large, rounded, obscurely crenate . . . . . *W. coccinea.*
** Corolla-throat naked.
Glabrous; leaves small; pedicels filiform; flowers small, white . *W. religiosa.*

1. **W. mollissima**, Wall. (*W. tomentosa*, Roem. & Schult.; Bedd. Sylv. Madr. 159; Brand. For. Fl. 323).—*Let-top-thein.*—A tree (40 + 10—12 + 3—5) shedding leaves in H.S., all softer parts shortly and softly pubescent; leaves elliptical to obovate-oblong, acute at the base, on a slender pubescent petiole 1-3 lin. long, 3-4 in. long, shortly and rather abruptly acuminate, entire, membranous, on both sides shortly pubescent; flowers showy, yellowish, on 3-5 lin. long pubescent pedicels, forming a shortly pubescent, divaricate, short-peduncled corymb-like cyme at the end of the branches;

calyx-lobes about a line long, ovate, blunt; corolla-tube short, glabrous, the limb tomentose, dull-yellowish, the throat closed by 10 lively orange-coloured thick cuneate 2- or 3-lobulate scales much shorter than the corolla-lobes; follicles elongate-linear, cylindrical, with a furrow on each side, glabrous, corky-lenticellate, 8-9 in. long, acuminate.

Hab.—Common in the lower and upper mixed forests, from Chittagong and Ava down to Tenasserim, up to 2,000 ft. elevation.—Fl. Apr.-May; Fr. C.S.—s + l.—SS.=SiS. Metam.

Remarks.—Wood yellowish, rather light, close-grained, soft.—□′=55 pd.

2. **W. Wallichii,** Dalz. and Gibs., not DC.—"A shrub; leaves elliptic obovate, acute at the base, obtusely acuminated, covered all over with dark-brown tomentum; scales inside ovate-rounded, half the length of the lobes; flowers and follicles very like those of *W. tomentosa.*"—(Dalz. and Gibs.)

Hab.—Burma.

3. **W. tinctoria,** R. Br.; Bedd. Sylv. Madr., t. 241; Brand. For. Fl. 324.—A leaf-shedding tree (40 + 10—15 + 3—4), all parts glabrous; leaves elliptical to oblong, obtuse or acute at the base, on about a line long petiole, 2-4 in. long, shortly and bluntish acuminate or acuminate, rarely blunt, entire, firmly membranous, glabrous; flowers middling-sized, white, on very slender up to ½ an in. long pedicels, forming a lax, divaricate, glabrous, short-peduncled corymb at the end of the branchlets; calyx glabrous, about a line long, the lobes bluntish; corolla-lobes elongate-oblong, nearly ½ an in. long, the throat bordered by many, branched, white, filamentose scales; follicles slender, linear, by pairs, at first united at both ends, finally separating, 1-1½ ft. long, glabrous.

Hab.—Burma.

Remarks.—Wood beautifully white, close-grained, hard, resembling ivory. Good for turning. Leaves said to yield an inferior kind of indigo.

4. **W. coccinea,** Sims.—An evergreen tree (40—50 + 10—20 + 3—5), all parts glabrous; leaves oblong to elliptical, obtuse or acute at the base, on a slender petiole about 2 lin. long, 2-4 in. long, rather long but bluntish acuminate, membranous, entire, glabrous; flowers showy, dull-red, on thick 2-4 lin. long pedicels, solitary or by 3 or more forming a short-peduncled, poor, glabrous corymb at the end of the branchlets; calyx conspicuous, about 3 lin. long, the lobes broadly ovate, almost acute; corolla of a thick fleshy texture, with an ample short tube, the limb about an inch across, the throat furnished with 5 crimson, broad, rounded, somewhat crenulate scales; follicles by pairs, linear, about as thick as the little finger, and nearly 12 in. long, glabrous, corky-lenticellate.

Hab.—Chittagong hills.—Fl. Apr.

Remarks.—Wood white, very light, but firm. Much used by turners for making palkees.

5. **W. religiosa,** Bth.—A small shrub, all parts glabrous; leaves small, linear to linear-oblong and lanceolate, shortly petioled, rounded or acute at the base, acuminate, 1-2½ in. long, membranous, glabrous; flowers small, white, on filiform glabrous pedicels up to ½-⅓ in. long, forming a short-peduncled poor cyme at the end of the branchlets; calyx glabrous, the lobes lanceolate, acute, about ½ lin. long; corolla almost rotate, minutely puberous, without scales or fringes at the throat, the tube very short and glabrous, the lobes of the limb oval, blunt; follicles linear, terete, paired, smooth and glabrous, 3-5 in. long.

Hab.—Tenasserim and the adjoining Siamese provinces.—Fl. H.S.

NERIUM, L.

Calyx 5-parted, the lobes lanceolate, with numerous glands at the base inside. Corolla-tube narrow-funnel-shaped, twisted in bud, the throat with 5 laciniate-toothed scales. Stamens inserted at the middle of the tube; filaments ligulate, short; anthers at the base produced into 2 tails, terminated by spirally twisted pilose bristles. Nectary none. Ovaries 2, somewhat cohering, many-ovuled; style filiform, dilated at the apex; stigma short, 5-glandular at the base. Follicles connate, elongate, valvately dehiscing into two, many-seeded. Seeds oblong, pubescent, comose, albuminous.—Shrubs, with whorled or occasionally opposite leaves. Flowers fragrant, in terminal cymes.

1. **N. odorum,** Sol.; Brand. For. Fl. 328.—An evergreen large shrub, all parts glabrous; leaves linear-lanceolate to linear, acuminate at both ends, on a strong 3-4 lin. long petiole, 3-4 in. long, entire, glabrous, rigidly coriaceous, closely and obsoletely impressed, parallel-veined; flowers showy, white, on short thick pedicels, forming a short, glabrous, corymbose cyme at the end of the branchlets; corolla about an inch across; follicles connate, about 3 in. long, linear-lanceolate, straight, truncate, glabrous.

Hab.—Cultivated in native gardens and villages, especially around monasteries, of Burma.

ASCLEPIADEÆ.

Flowers regular, hermaphrodite. Calyx free, deeply 5-parted or the sepals distinct, often glandular at the base inside, imbricate in bud. Corolla-limb 5-toothed or -lobed, twisted-imbricate or valvate in bud, the throat with or without scales or appendages alternating with the lobes. Stamens 5, inserted at or near the base

of the corolla; filaments short, connate or rarely free; anthers united in a tube (called *gynostegium*) enclosing the style, 2-, or by division of the cells, more or less completely 4-celled, the cells opening inwards, the connective terminating in a short appendage or more frequently in an inflexed membrane; staminal corona consisting of variously shaped, glandular, membranous or fleshy appendages attached to the back of the filaments or the anthers, sometimes united in a ring or cup, very rarely wanting; pollen consolidated into 1 or 2 masses in each anther-cell, attached in the opened anther in pairs or in fours (1 or 2 from each of the adjoining anthers) to small processes of the stigma between the anthers, and ultimately detached from the stigma and carrying off the pollen-masses. Ovary of 2 distinct carpels, each with numerous or at least several ovules attached to the inner angle; styles united immediately above the carpels and thickened with the anther-tube into an angular body (the so-called *stigma*), the apex in the centre either truncate or more or less conical or elongate and beak-like, entire or 2-lobed. Follicles paired or solitary by abortion. Seeds usually pendulous, compressed, often marginate, with a long silky tuft or coma of hairs at the hilum, the testa smooth or rough. Albumen scanty. Embryo straight, with leafy cotyledons, the radicle short and superior.—Undershrubs or shrubs, often twining or scandent, rarely herbs or trees, usually abounding in milky juice, with simple usually opposite leaves. Stipules none or obsolete. Flowers often small, in racemes or cymes often reduced to umbels, axillary or lateral from between the opposite petioles. Bracts small; bractlets none or very minute.

A large order the members of which usually abound in acrid and bitter milk which often proves more or less poisonous. The roots are generally acrid, whence some of them act as emetics, as *Tylophora asthmatica* and *Secamone emetica;* others are diaphoretic and sudorific. *Asclepias curassavica* or wild ipecacuanha, a West Indian plant now locally domesticated in Burma, serves also as an emetic and purgative. The roots of *Hemidesmus Indicus* are largely employed as a substitute of sarsaparilla. Caoutchouk of inferior quality is produced from the milk of a few species. Indigo is yielded by *Marsdenia tinctoria.* Others are remarkable for their strong fibre, like *Marsdenia tenacissima, Orthanthera viminea,* the mudar plant (*Calotropis*), and a few others. None of the 50 species or thereabouts occurring in Burma are of any special interest from a forester's point of view.

* *Filaments upwards or entirely free; pollen-masses granular. Woody twiners.*

× Corolla without a corona; anthers terminated by a thick oblong bearded appendage. Woody climbers . . *Pentanura.*

× × Corolla with a corona of free or connate scales variously inserted.

Corolla rotate, at the throat 5-callous, the callosities terminating in an erect filiform appendage curved at the apex. Pollen-masses 4 . . . . . *Finlaysonia.*

Corolla rotate, with 5 blunt scales in the throat. Pollen-mass 1 . *Streptocaulon.*

Corolla almost funnel-shaped to rotate, with 5 membranous scales adhering to the anthers in the swollen middle-part of the tube . . . . . *Cryptolepis.*

∗ ∗ *Filaments wholly connate; pollen-masses smooth.* (*Corolla-lobes usually twisted-imbricate.*)

× Pollen-masses 4 to each anther.

Twiner; staminal crown of 5 scales at the back of the anthers with internal appendages . . . . . *Toxocarpus.*

× × Pollen-masses 2 to each anther.

○ Pollen-masses pendulous.

Erect shrubs or under-shrubs; staminal crown double, the outer one shortly wavy-lobed, the inner one of 5 linear-oblong lobes; corolla almost bell-shaped, angular, the limb 5-cleft . . *Calotropis.*

○ ○ Pollen-masses horizontal or erect. Twiners.

Corolla without appendages between the lobes; staminal crown of 5 segments adnate at the base with a short erect, free or adnate point . . . . . *Marsdenia.*

As former, but segments of the staminal crown with a compressed appendage inside at the top . . . . . *Pergularia.*

Corolla very small, nearly rotate, with scales between the lobes; staminal crown none or reduced to 5 scarcely prominent glands at the base of the gynostegium . . . . . *Gymnema.*

PENTANURA, Bl.

Calyx small, 5-cleft, 5-glanded at the base inside. Corolla rotate or campanulate-bellshaped, deeply 5-cleft, naked at the throat, slightly twisted or almost valvate. Corona none. Stamens attached to the base of the corolla, the filaments free; anthers oblong, naked, terminated by elongate bearded appendages which are connivent or finally spreading at the tips. Pollen granular. Stigma dilated-5-gonous, 2-lamellate. Follicle divaricate. Seeds comose.—Twining shrubs or undershrubs, with opposite leaves. Flowers small, in small reduced axillary cymes.

1. **P. khasiana,** Kz.—A large twining shrub, the young shoots minutely brown-pubescent; leaves lanceolate, acute at the base, on a slender petiole up to ⅓ in. long, acuminate, 2-3 in. long, coriaceous, glabrous when full grown, beneath pale-coloured and dark net-veined; flowers rather small, apparently yellowish, on stout 2-3 lin. long pedicels, forming small short-peduncled minutely puberulous cymes in the axils of the leaves; bracts lanceolate, acuminate, about a line long; corolla glabrous, fleshy, the lobes ovate-lanceolate, about 2 lin. long, spreading, thinly appressed-puberulous inside; follicles (unripe) very like those of *Finlaysonia*, obliquely ovoid, divaricate, smooth and glabrous.

Hab.—Ava hills.—Fl. R.S.

FINLAYSONIA, Wall.

Calyx deeply 5-cleft. Corolla rotate, the 5 lobes alternating with as many capillary erect bristles hooked at the apex. Filaments distinct, inserted between the tubercles at the throat. Anthers nude, adhering at the base to the middle of the stigma, terminated by a broadly ovate appendage. Pollen-grains 20, collected into 4 granular masses to each anther. Stigma large, ovate, 5-gonous at the base. Follicles ventricose-ovate, divaricate, hooked-beaked. Seeds scarcely comose.—Twining shrubs, with fleshy-coriaceous leaves. Flowers small, in corymbs.

1. **F. obovata,** Wall.—An evergreen, large, woody twiner, all parts quite glabrous; leaves opposite, obovate to obovate-oblong, acuminate at the base, on a petiole ½-1 in. long, mucronate or apiculate, entire, fleshy-coriaceous, quite glabrous, 1½-3 in. long; flowers rather small, pale ochre-coloured to yellowish brownish, fœtid, on thick about a line long pedicels, forming glabrous robust cymes in the axils of the leaves and at the end of the branchlets; calyx minute, 5-parted, the segments ovate, shortly ciliate; corolla rotate, 5-parted, the lobes broadly ovate, blunt, glabrous, or more usually the inside for one-half white-pilose, between the lobes callose and sending up an erect filiform appendage recurved at the apex; stamens glabrous, the filaments very short, rather flat; anthers ovate, large, broadly and inflexed apiculate; pollen-masses 20, very minute, granular; style filiform, the stigma large, ovate, 5-cornered at the truncate base; retinacles parallel with the angles of the stigma, capillary, dark-brown, at the base augmented by a globular minute gland attached to the angle of the base of the stigma, at the apex flatly-dilated, ovate, blunt; follicles fleshy-coriaceous, ventricose-ovate, up to 3 in. long, smooth, terminating in a strong-hooked beak; seeds numerous, retrorsely imbricate, very flat, obovate-oblong, nearly an inch long, blunt, sparingly and retrorsely pilose-fringed towards the narrowed base.

Hab.—Frequent in the tidal forests of Lower Pegu and Upper Tenasserim. —Fl. Aug.-Oct.; Fr. C.S.—l.—SS.=Sal.

STREPTOCAULON, WA.

Calyx 5-parted. Corolla rotate, 5-parted, furnished at the throat with 5 short filiform scales alternating with the corolla-lobes. Filaments distinct, inserted in the tube; anthers nude, laterally united at the apex by means of the appendages. Pollen-masses granular, solitary, united by fours. Stigma 5-gonous. Follicles cylindrical, very spreading, smooth or longitudinally membranous-

winged. Seeds comose.—Usually woody twiners, glabrous to tomentose. Flowers minute, in short interpetiolar cymes.

Tomentose; follicles smooth	*S. tomentosum.*
Glabrous or pubescent; follicles with numerous longitudinal membranous wings	*S. extensum.*

1. **S. tomentosum,** Wight.—An evergreen woody twiner, often shedding leaves in H.S. in drier situations, all softer parts tomentose; leaves obovate-oblong to ovate, rounded at the narrowed base, on a puberulous petiole $\frac{1}{3}$-$\frac{1}{2}$ in. long, acute or shortly acuminate, $2\frac{1}{2}$-3 in. long, chartaceous, above rough-puberulous, beneath pale-coloured and shortly tomentose; flowers minute, very shortly and slenderly pedicelled, forming short-peduncled pubescent cymes in the axils of the leaves and at the end of the branchlets; sepals ovate, acute, glabrous or pubescent, minute; corolla-lobes $\frac{1}{2}$ lin. long, ovate-triangular, glabrous; follicles from elongate ovate-lanceolate to linear, $1\frac{1}{2}$-$2\frac{1}{2}$ in. long, long-acuminate, striate, velvety.

Hab.—Not unfrequent in the open forests, especially the Eng forests, all over the Tharrawadee zone of Pegu up to Ava; Tenasserim from Moulmein as far south as Tavoy.—Fl. March-Sept.; Fr. C.S.—l.—SS.=Dil.

2. **S. extensum,** Wight.—A leaf-shedding or an evergreen spreading woody twiner, all softer parts pubescent or almost glabrous; leaves more or less ovate, rounded at the base, on a glabrous or puberulous petiole $\frac{1}{2}$-$\frac{1}{3}$ in. long, acuminate, 3-5 in. long, membranous, entire, shortly pubescent, especially beneath, or glabrous or nearly so; flowers minute, whitish, on slender, glabrous pedicels about 3-4 lin. long, forming glabrous or almost glabrous, brachiate, spreading, slender panicles in the axils of the leaves and at the end of the branchlets; sepals minute; corolla rotate, the lobes linear-oblong, twisted, about $2\frac{1}{2}$ lin. long, glabrous; follicles ovate, very spreading, about $1\frac{1}{2}$ in. long, bluntish and strongly acuminate, with numerous (about 16), rather broad, membranous, longitudinal wings, quite glabrous.

Var. 1, **extensum proper:** leaves more or less puberulous, especially beneath.

Var. 2, **paniculatum** (*Myriopteron paniculatum,* Griff.): leaves glabrous or nearly so.

Hab.—Frequent in the lower mixed forests, entering the savannahs, all over Pegu and Martaban down to Tenasserim; var. 2: in Ava.—Fl. Sept.; Fr. Jan.-Feb.—l.—SS.=SiS. All.

CRYPTOLEPIS, R. Br.

Calyx turbinate, 5-cleft, with 5 crenulate glands within. Corolla funnel-shaped or rotate, the throat nude, the tube inflated at the

middle and furnished with 5 fleshy scales alternating with the spreading sinistrorsely twisted lobes. Stamens 5, inserted above the base of the tube, the filaments very short; anthers sagittate, acuminate, bearded on the back. Pollen-grains solitary, granulate, united into 4 masses, attached to the linear-spatulate appendages divisible into 2. Stigma 5-gonous. Follicles cylindrical, divaricate, smooth. Seeds comose.—Woody twiners, glabrous. Flowers small, in short axillary cymes.

1. **C. Buchanani,** Roem. and Schult.—A large woody twiner, all parts glabrous; leaves oblong to obovate-oblong, acute at the base, on a slender petiole 3-4 lin. long, retuse with a mucro or apiculate, entire, membranous, glabrous, glaucous beneath, 2-4½ in. long; flowers small, yellowish, on short thick pedicels, forming small glabrous cymes in the axils of the leaves; calyx ½ lin. long, glabrous, the lobes ovate-lanceolate; corolla glabrous, the lobes linear-lanceolate, about 2 lin. long; follicles linear, cylindrical, about 2½-3 in. long, acuminate, smooth and glabrous.

Hab.—Rather rare in the open, especially the low, forests of the Tharrawadee zone of Prome; also Ava.—Fr. Jan.-Feb.—l.—SS.=Dil.

TOXOCARPUS, Wght. and Arn.

Calyx 5-parted. Corolla rotate, with a very short tube, 5-cleft, the lobes narrow-linear to oval, dextrorsely twisted or imbricate in the bud. Staminal crown of 5 lobes or scales attached to the back of the anthers, and each with an appendage inside. Pollen-grains 20, very small, attached in 4 masses to the processes of the stigma, which latter terminates in a long point or beak. Follicles very spreading.—Woody climbers. Flowers small, in axillary cymes.

1. **T. laurifolius,** Wight.—An evergreen lofty twiner, all parts glabrous, the branches corky-tubercled; leaves elliptical to elliptically ovate, rounded or obtuse at the base, on a rather slender petiole ½-1 in. long, shortly and abruptly acuminate to apiculate, entire, 2½-5 in. long, thin-coriaceous, glabrous, shining above; flowers small, pale yellow with a red or orange-red staminal crown, on slender, glabrous or nearly glabrous pedicels about a line long, forming glabrous or slightly rusty-tomentose almost sessile cymes in the axils of the leaves, the bracts and bractlets minute, subulate; sepals oblong, blunt; corolla-lobes a line long, oval-oblong, blunt, slightly pubescent inside; follicles slender, horizontally spreading, cylindrical, the thickness of a goose-quill, about 5 in. long, corky-lenticellate, glabrous.

Hab.—Not unfrequent along choungs in the tropical forests of the Pegu Yomah.—Fl. Jan.—s: l.—SS.=SiS., etc.

CALOTROPIS, R. Br.

Calyx 5-parted. Corolla almost bell-shaped, deeply 5-cleft, the tube angular, the angles introrsely saccate. Staminal crown of 5 lobes, the lobes linear-oblong, almost compressed and keel-shaped, vertically adnate to the gynostegium, but free below and recurved or involute. Anthers terminated by a rather broad membrane. Pollen cultriform, compressed. Stigma 5-gonous, depressed and minutely apiculate. Follicles ventricose, smooth.—Erect shrubs or undershrubs, the juice milky. Flowers rather conspicuous, in axillary umbel-like racemes.

Flowers about an inch or more in diameter; staminal crown as long as the corolla-lobes . . . . . *C. gigantea.*
Flowers ⅓ to nearly ½ smaller; staminal crown much shorter than the corolla-lobes . . . . . *C. procera.*

1. **C. gigantea,** R. Br.—*Ma-yo-pin.*—An evergreen shrub, 2-4 ft. high, the young parts densely mealy floccose; leaves almost sessile, elliptical to oblong and oboval-oblong, rounded or almost cordate at the base, bluntish, entire, sappy membranous, 2½-5 in. long, while young, especially beneath, fugaceously floccose-tomentose; flowers conspicuous, lilac to white, on floccose pedicels about ½-1 in. long, forming shorter or longer peduncled, floccose, glabrescent, umbel-like racemes in the axils of the leaves and at the end of the branchlets; calyx floccose-pilose, glabrescent, the lobes ovate-lanceolate, acute, a line long; corolla nearly an inch across, fleshy, the lobes ovate-lanceolate, about ½ in. long, somewhat twisted, bluntish; staminal crown bluish or white, the lobes reaching the base of the anthers and at the base produced into a circinnate blunt prolongation doubly shorter than the ovoid gynostegium; follicles singly, irregularly ovoid-oblong, inflated, about 1½ to 2 in. long, while young floccose-tomentose, soon turning glabrous.

Hab.—Frequent in agrarian lands, especially fallow fields, and along river banks of Prome and Pegu; Upper Tenasserim; also cultivated for medicinal purposes.—Fl. H.S.—l.—SS.= ∞ All.

Remarks.—Yields the mudar-root. The fibre is strong and used in rope-making. The wood is said to give superior charcoal for gunpowder.

2. **C. procera,** R. Br.—*Ma-yo-pin.*—An evergreen shrub, 2-4 ft. high or higher, the young parts mealy-floccose; leaves exactly as those of the preceding species; flowers nearly half the size of those of *C. gigantea,* but the staminal crown much shorter than the corolla-lobes, and the corolla more regularly and shallow-bell-shaped; lobes of the staminal column as long as the depressed gynostegium, at the base produced into a circinnate usually shortly acuminate pro-

longation about half the length of the gynostegium; follicles same as those of the preceding species.

Hab.—Frequent in waste places, agrarian lands and river banks all over Ava and Prome district.—Fl. H.S.; Fr. C.S.—1.—SS.=All. Aren. CaS.

MARSDENIA, R. Br.

Calyx 5-parted. Corolla almost bell-shaped, rotate or very rarely urn-shaped, 5-cleft, the lobes twisted. Staminal crown of 5 segments adnate to the gynostegium at the base, sometimes with free basal auricles or almost peltate, the upper end erect and free, shorter or hardly longer than the anthers. Anthers terminating in a membrane. Pollen-masses 2 to each anther, oblong or rarely obovoid, erect. Stigma (or summit of style) blunt or terminating in a cone or in a long beak.—Woody or herbaceous twiners, rarely erect. Flowers small, forming irregular cymes or panicles, or more usually simple umbel-like racemes between the axils of the petioles.

Adult parts all glabrous; corolla glabrous, densely bearded at the throat . . . . . *M. tinctoria.*
All softer parts more or less tomentose; corolla pubescent, not bearded at the throat . . . . . *M. tenacissima.*

1. **M. tinctoria,** R. Br.—An evergreen woody twiner, the young shoots slightly appressed-pubescent; leaves ovate to ovate-oblong, rounded or cordate at the base, on a slender glabrous petiole about an inch long, acuminate, entire, membranous, 4-5 in. long, glabrous when full-grown; flowers small, yellow, shortly pedicelled and fascicled, forming slightly pubescent, interpetiolar, simple or slightly branched racemes shorter than the leaves; calyx puberulous, minute, the lobes bluntish; corolla almost bell-shaped, nearly a line long, glabrous, densely hirsute fringed at the throat, the lobes short; lobes of staminal crown subulate, as long as the gynostegium.

Hab.—Prome.

2. **M. tenacissima,** Wight & Arn.—A large woody twiner, all softer parts more or less densely pubescent or tomentose; leaves ovate to rotundate-ovate, deeply sinuate-cordate at the base, on a tomentose petiole 2-2½ in. long, shortly acuminate, 3-4 in. long, entire, densely pubescent or tomentose, membranous; flowers small, yellowish, on slender puberulous pedicels 3-4 lin. long, in small umbellets, forming larger or smaller, dichotomously branched, interpetiolar panicles usually shorter than the leaves; calyx pubescent, the lobes oblong, bluntish; corolla pubescent outside, salver-shaped, green, the lobes short and yellow, oblong, blunt; lobes of the staminal crown rather thick, linear, at the apex truncate, notched or almost 2-forked, nearly as long as the gynostegium; stigma blunt-

apiculate; follicles solitary, elongate-ovoid, strongly and bluntish acuminate, especially while young densely puberulous, 2½ to 3 in. long.

Hab.—Ava, along the banks of the Irrawaddi; Chittagong.—Fl. H.S.

GYMNEMA, R. Br.

Calyx 5-parted, the lobes erect. Corolla rotate or almost bell-shaped, 5-cleft, furnished at the throat with 5 scales or tubercles alternating with the lobes. Staminal crown none or reduced to 5 scarcely prominent protuberances at the base of the gynostegium. Anthers terminating in a membrane. Pollen-masses 2 to each anther, obovoid or oblong, erect. Stigma short and blunt or conical, or rarely elongate.—Usually woody or herbaceous twiner, rarely erect. Flowers small, umbellate, the umbels either solitary or by twos on short interpetiolar peduncles, or axillary and opposite.

1. **G. acuminatum,** Wall.—An evergreen, large, woody climber, the young parts pubescent; bark spongy, deeply cracked; leaves ovate to elliptically oblong, acute at the rounded base, on a puberulous petiole about ½ in. long, acuminate, 2½-4 in. long, entire, chartaceous, glabrous above except on the nerves, beneath shortly tomentose or pubescent, glabrescent with age; flowers small, white, on about a line long pubescent pedicels, forming small, almost globular, crowded umbellets usually in pairs, rarely solitary between the opposite petioles; calyx pubescent, the lobes bluntish; corolla glabrous, the scales ovate, almost membranous; stigma conical, longer than the stamens; follicles conical from a thick base, 2 in. long, at length glabrous; seeds large, surrounded by a membranous margin.

Hab.—Forests of Chittagong; Upper Tenasserim.—Fl. begin. of R.S.

PERGULARIA, L.

Calyx 5-parted. Corolla salver-shaped with an urceolate tube, the limb 5-cleft, sinistrorsely twisted in bud. Staminal crown of 5 ovate flat segments which are augmented by a compressed, erect, or arcuate-falcate appendage inside towards the apex. Anthers terminated by a membrane. Pollens erect, ovoid-oblong. Stigma nude. Follicles ventricose-lanceolate, smooth. Seeds comose.—Woody climbers, with opposite leaves. Flowers in interpetiolar cymes.

Corolla-tube about 3½-4 lin. long, villous within, the lobes 2 lin. long . . . . . *P. odoratissima.*

Corolla-tube 1-1½ lin. long, quite glabrous within, the lobes linear, nearly twice the length of the tube . . . . . *P. pallida.*

1. **P. odoratissima,** L.; Brand. For. Fl. 334.—A large twining shrub, the young shoots more or less pubescent; bark spongy and deeply cracked; leaves from a sinuate-cordate base ovate, on a slender petiole 1-1¾ in. long, acuminate, 3-4 in. long, membranous, puberulous on the nerves beneath; flowers rather small, greenish yellow or orange, very fragrant, on slender puberulous pedicels up to an inch long, forming a cyme-like, reduced, short-peduncled, interpetiolar raceme; corolla nearly ½ in. long, the tube twice the length of the oblong lobes, villous inside up to the throat; follicles ovate-lanceolate, incurved-acuminate, glabrous, 3-4 in. long.

Hab.—Ava; and in gardens elsewhere in Burma.—Fl. R.S. & C.S.; Fr. C.S.

2. **P. pallida,** WA.; Brand. For. Fl. 334.—A large twining shrub, the shoots pubescent; leaves ovate, cordate at the base, on a slender pubescent petiole ½-1 in. long, acuminate, 2-4 in. long, pubescent while young, glabrescent, membranous; flowers small, pale yellow, hardly scented, on slender pubescent pedicels about ½ in. long, forming short-peduncled, many-flowered, interpetiolar or axillary cymes; corolla-tube half the length of the linear, bluntish, 3 lin. long lobes, quite glabrous within except near its base; follicles lanceolate, glabrous, 3 in. long.

Hab.—Ava, apparently frequent.—Fl. R.S.; Fr. C.S.

GENTIANEÆ.

Flowers hermaphrodite. Calyx persistent, consisting of 4 or 5, rarely more, lobes or segments much imbricate. Corolla usually regular, with 4 or 5, rarely more lobes twisted or otherwise imbricate or induplicate in bud. Stamens usually as many as corolla-lobes, and alternate with them, usually inserted in the tube or at the throat of the corolla; filaments usually free; anthers versatile, the cells parallel, opening longitudinally or in terminal pores. Ovary 1-celled, but with the 2 parietal placentas projecting into the cavity so as to partially divide it into 2 or 4 cells, or rarely completely 2-celled, with numerous ovules in each cell; style simple, entire or with 2 short stigmatic lobes. Fruit a capsule, opening septicidally in 2 valves, or rarely indehiscent, or a succulent berry. Seeds small. Albumen fleshy or horny. Embryo small, straight, axile, with short cotyledons.—Usually herbs or undershrubs, rarely trees, erect or climbing, with opposite (very rarely alternate) simple leaves. Stipules none. Flowers usually in cymes or corymb-like panicles, rarely clustered or solitary.

FAGRÆA, Thbg.

Calyx 5-parted or 5-cleft, the lobes blunt, imbricate. Corolla funnel- or salver-shaped, the tube cylindrical or widened upwards,

the limb 5- (very rarely 6- or 7-) -cleft, the lobes oblique and almost twisted-imbricate in the bud. Stamens 5, inserted in the tube of the corolla; filaments filiform; anthers incumbent. Ovary 2-celled or 1-celled, with numerous anatropous ovules attached to the thick almost 2-lobed (the lobes involute) placentas; style filiform, exserted or included; stigma peltate. Berry globular to ovoid and almost cylindrical, 2- or 1-celled. Seeds numerous, minute, crustaceous, immersed in the pulpy-enlarged placentas. Embryo minute, enclosed in the horny albumen, the cotyledons very short and blunt, the radicle long.—Trees or shrubs, often scandent or epiphytical, with opposite more or less coriaceous leaves, the petiole at the base dilated in an entire or auricle-like 2-lobed stipular sheath. Flowers white or yellowish, often large, solitary, or in terminal cymes, corymbs, racemes or panicles.

* *Flowers large, above an inch long, solitary or by* 3 *or* 5 *in a short-peduncled terminal corymb.—Shrubs, often scandent.*

× Corolla-tube long-exserted, above the middle or at the summit dilated into the limb . . . . . *F. carnosa.*

×× Corolla-tube short, or from the base funnel-shaped dilated.

Calyx about an inch long or longer; the lateral nerves distinct, but thin and immersed on the under-surface of the leaves . . *F. auricularia.*

Calyx only about ⅓ in. long; the nerves of the leaves beneath not or almost not visible . . . . . *F. obovata.*

** *Flowers small, up to an inch long or somewhat longer. Erect trees.*

Flowers clustered or in small cymes, forming a terminal peduncled raceme; leaves penninerved . . . . . *F. racemosa.*

Flowers in terminal or axillary, long-peduncled, many-flowered corymbs; nerves of leaves beneath very obsolete and immersed *F. fragrans.*

1. **F. carnosa,** Jack.—An evergreen parasitical (?) shrub with smooth greyish bark, all parts glabrous; leaves almost rotundate-obovate, on a compressed petiole, with a short reflexed point, entire, with recurved borders, very smooth, thick and fleshy; flowers large, dull yellowish white, solitary and terminal, nearly sessile, at the base embraced by a few sheathing bracts; calyx 5-parted; corolla-tube about 4 in. long, expanding into a 5-cleft limb; style about half so long as the corolla-tube, with a 4-lobed stigma; berry the size of a small hen's egg, ovate, seated on the persistent calyx, rather pointed, 2-celled, many-seeded.

Hab.—Upper Tenasserim.

2. **F. auricularia,** Jack.—An evergreen large shrub, all parts glabrous; leaves obovate to obovate-lanceolate, blunt or shortly apiculate, tapering into the broad petiole sheathing at the base, 4-6 in. long, thick-coriaceous and quite smooth, entire, the lateral nerves thin and immersed; flowers very large and showy, white,

turning yellowish, on thick ½ in. long pedicels 2-bracted at the apex, by 3 or rarely by 5 (in this case the two lateral flowers basal) on a short, thick, terminal peduncle; calyx about an inch long; corolla 3 to 5 in. across, the tube about an inch long; style exserted; berry ovate, acuminate, the size of a duck's egg, glaucous-green, smooth.

Hab.—Burma, probably Tenasserim.

3. **F. obovata,** Wall.; Bedd. Sylv. Madr. 144.—*Nyoung-kyap.*—An evergreen, large, scandent or erect tree, up to 35 ft. high, with grey stems up to thickness of a man's body, all parts glabrous; leaves from obovate to obovate-oblong, tapering in a rather long broad petiole, shortly apiculate, 3 to 6 in. long, fleshy coriaceous, entire, smooth, glossy above, without visible lateral nerves; flowers white, turning yellowish, fragrant, rather large, on short thick pedicels 2-bracted at the apex, forming a short and thick-peduncled few- (3-5-) flowered terminal corymb; calyx only about ⅓ in. long; corolla funnel-shaped from the base, about 1½-2 in. long or somewhat longer; berries ovate, the size of a pigeon's egg, smooth and glossy, acuminate, sea-green.

Hab.—In the tropical and moister mixed forests from Chittagong, Pegu and Martaban down to Tenasserim.—Fr. C.S.—s.—SS.= ∞.

4. **F. racemosa,** Jack.—An evergreen tree up to 50 ft. high, all parts glabrous; leaves large, oblong to ovate and elliptically-oblong, acute at the base, on a short petiole sheathing at the base, 5 in. to 1½ ft. long, apiculate, entire, coriaceous, glabrous, penninerved; flowers white or slightly flesh-coloured, rather small, on short or very short pedicels, several together in small clusters and forming a terminal, peduncled, glabrous raceme, the bracts small, broad, blunt; calyx about 3 lin. long; corolla funnel-shaped, nearly an inch long; berries ovoid, about ½ in. long, truncate-acuminate, smooth.

Hab.—Frequent in the tropical forests of the Andaman islands.—Fl. Fr. Feb.—May—s × l.—SS.=SiS. Metam.

5. **F. fragrans,** Roxb.—*Anan.*—An evergreen tree (25—30 + 10—12 + 3—4), all parts glabrous; leaves oblong-lanceolate to elliptically oblong, tapering in a slender petiole ⅓ to ½ in. long, shortly and bluntish acuminate, 2-3 in. long, entire, coriaceous, glabrous, the lateral nerves very obsolete and immersed; flowers rather small, yellowish white, on slender up to ½ in. long pedicels 2-bracted at the middle or further downwards, forming long-peduncled slender, many-flowered, glabrous corymbs in the axils of the upper leaves; calyx only a line long; corolla funnel-shaped, nearly ½ in. long; berries ovoid, reddish, the size of a pea.

Hab.—Very common in the Eng and hill Eng forests of Tenasserim from Moulmein southwards.—Fl. June—Jan.—l.—SS.=Lat.

Remarks.—Wood yellow or light brown, white streaked. Break-weight= 400-500 pd.—Said to be imperishable if exposed to water, and *Teredo navalis* will not attack it. Used for house-building, posts, piles for bridges and wharves. Recommended for railway sleepers.

BORAGINEÆ.

Flowers usually hermaphrodite, regular or nearly so. Calyx free, 5- (rarely 4- or 6-) -cleft or toothed, or rarely irregularly slit. Corolla salver-shaped to almost rotate-salver-shaped, with a longer or shorter tube, 5- rarely 4- or 6-lobed, imbricate or induplicate in bud. Stamens as many as corolla-lobes and alternating with them, or very rarely fewer, inserted in the corolla-tube; anthers 2-celled, dehiscing longitudinally or rarely in apical pores. Ovary superior, entire or 4-lobed, either 4-celled with a solitary ovule in each cell, or 2-celled and the cells 2-ovuled (in both cases the ovary consists of 2 carpels only), the ovules laterally attached, ascending or pendulous; style terminal or between the lobes. Fruit either a drupe with the endocarp entire or separating into 2 or 4 pyrenes, or dry and separating into 4 or rarely 2 nuts. Albumen none or scanty. Embryo straight, with flat and rather thick or rarely folded cotyledons, the radicle short.—Herbs or perennials, usually rough from coarse hairs, or shrubs and trees, which are glabrous or of a softer indument, with alternating or very rarely opposite leaves, simple or very rarely deeply lobed. Flowers in one-sided spikes or racemes circinnately rolled back when young and often forked or dichotomous, or rarely in irregularly branched panicles or solitary. Bracts and bractlets often wanting.

Style twice forked; calyx more or less tubular, forming a cup under the drupe; trees or shrubs . . . . . *Cordia.*
Style 2-lobed, without any thick ring; calyx deeply cleft; trees or shrubs . . . . . *Ehretia.*
As preceding, but style simple, with a capitate obscurely 2-lobed stigma; shrubs . . . . . *Rhabdia.*

CORDIA, L.

Calyx tubular or bell-shaped, 5-toothed or irregularly lobed. Corolla-tube cylindrical or funnel-shaped, the limb 5- or rarely 6- or more-lobed. Stamens inserted in the tube; anthers included or exserted. Ovary entire, 4-celled, the cells with a solitary pendulous ovule; style terminal, twice-forked. Fruit a drupe, the endocarp hard, 4- or by abortion fewer-celled. Albumen none. Cotyledons longitudinally folded, the radicle superior.—Trees or shrubs, with entire or toothed leaves. Flowers in cymes, sometimes con-

tracted into heads, at first terminal, but often becoming lateral from the growth of the branch. Bracts small or none.

* *Leaves beneath and calyx densely tomentose.*

Calyx about 4 lin. long; full-grown leaves smooth above and white-dotted . . . . . *C. fragrantissima.*

Calyx about 2½ lin. long; leaves above very scabrous from short hairs . . . . . *C. polygama.*

** *Leaves glabrous or pubescent beneath; calyx glabrous or puberulous.*

× Flowers small, white.

Corolla-tube as long or shorter than the calyx.

Glabrous; leaves without white dots on the upper side; drupes the size of a cherry, acuminate . . . . . *C. myxa.*

As former, but young shoots brown-pubescent; leaves puberulous beneath; drupes the size of a plum . . . . . *C. brunnea.*

Leaves white-dotted above; drupe the size of a pea, blunt with a mucro . . . . . *C. grandis.*

×× Flowers large and showy, orange or brick-red. Corolla-tube long-exserted.

Corolla-limb nearly an inch in diameter, crumpled; drupe the size of a cherry, crowned by the calyx-tube . . . . *C. subcordata.*

1. **C. fragrantissima,** Kz.—*Ka-lah-met.*—A leaf-shedding tree, all parts covered with a more or less dense partially fugaceous tomentum; leaves elliptical to elliptically ovate, acute or obtuse at the base, on a 1-2 in. long tomentose petiole, 3-8 in. long, acute or acuminate, entire or nearly so, when full-grown firmly membranous or almost coriaceous, above covered with a very fugaceous floccose tomentum and soon glabrescent and (in a dried state) white-dotted, beneath more or less tomentose from a pale-tawny secernible tomentum; flowers middling-sized, white, almost sessile, arranged in one-sided dichotomous racemes forming terminal and axillary densely tawny-tomentose cymes; calyx almost bell-shaped, about 4 lin. long, tawny-tomentose outside, glabrous inside, smooth or striate; corolla glabrous, the tube as long as the calyx, the lobes hardly half the length; ovary with a sessile stigma.

Hab.—Hills of Martaban and Upper Tenasserim.—Fl. May.

Remarks.—Wood very fragrant.

2. **C. polygama,** Roxb.; Bedd. Sylv. Madr. 146.—A small tree, all younger parts covered with a soft scabrescent tomentum; leaves more or less ovate, on a pubescent petiole 1-1½ in. long, rounded or obtuse at the base, 2-5 in. long, acute or bluntish, entire or obscurely lobed, beneath greyish and shortly but softly tomentose, above minutely white-dotted and very rough from short hairs; flowers small, white, almost sessile, forming forked shortly and fugaceously tomentose cymes at the end of the branches and in the forks of the branchlets; calyx almost campanulate-funnel-shaped, about 2½ lin. long, roughish puberulous, smooth; corolla glabrous, the tube as long as the calyx, the lobes half the length; drupes ovoid,

blunt with a minute mucro, glabrous, the size of a large pea, supported by the dilated funnel-shaped calyx.

HAB.—Rather rare in the hill Eng forests of Martaban, up to 2,000 ft. elevation.—Fr. March.—l.—SS.=Metam. (?).

3. **C. myxa,** L.; Bedd. Sylv. Madr. 145; Brand. For. Fl. 336. —*Thanap or toung-thanap.*—A tree (25—35+10—15+3—4), shedding leaves in H.S., the young shoots somewhat tawny-pubescent; bark about 1-2 lin. thick, corky, grey or brownish grey, fissured, that of the branchlets silvery-grey, sparingly lenticellate; leaves from broadly elliptical and almost ovate to obovate and almost rotundate, on an 1-2 in. long petiole, rounded or obtuse at the base, 1½-4 in. long, blunt to bluntish acuminate, usually bluntish and coarsely crenate to almost entire, chartaceous to firmly coriaceous, without dots on the upper surface, glabrous or a little rough beneath; flowers small, white, on short pedicels or sessile, one-sided-cymose, forming more or less compound glabrous or pubescent and glabrescent cymes in the axils of the young leaves and at the end of the branchlets; calyx smooth, bell-shaped, more than 2 lin. long, densely silky-pubescent inside; corolla glabrous, the lobes a line long, the tube included in the calyx; drupes ovoid, more or less acuminate, the size of a cherry or somewhat larger, yellow, smooth, edible, supported by the explanate calyx.

Var. 1, **myxa proper:** branchlets silvery-grey; leaves usually smaller and more repand-crenate, more coriaceous; berries about ½-1 in. diameter.

Var. 2, **brunnea** (*C. brunnea,* Kz.): branchlets brown, the young shoots densely brown-pubescent; leaves larger, of a more chartaceous texture, especially while young covered with a soft appressed-brown pubescence; drupes about an inch long.

HAB.—Frequent in all leaf-shedding forests, entering also the tidal forests, from Chittagong and Ava down to Tenasserim; var. 2: in the dry forests of Prome.—Fl. Feb.; Fr. Mar.-Apr.—s × l.—SS.=∞ Sal.

REMARKS.—Wood white, turning grey-yellow, light, fibrous, but close-grained, soft.—□′=33 pd.—Of little use except for fuel.

N. B.—There is another species of *Cordia* (apparently) of which only the leaves are known. These leaves are largely employed by the Burmese for cigar-envelopes. It is called "mhaya," and is said to grow abundantly in the Pegu Yomah.

4. **C. grandis,** Roxb.—*Tha-nap.*—A leaf-shedding, large, quick-growing tree, the young shoots slightly tawny-pubescent; leaves ovate to almost cordate-ovate, on a 1-3 in. long somewhat rough petiole, rounded or obtuse at the base, 3-7 in. long, bluntish, entire or nearly so, firmly membranous, glabrous, in a dry state copiously white-dotted above; flowers small, white, very shortly pedicelled or

almost sessile, forming a slightly fulvous-pubescent, soon glabrescent, ample, dichotomous, corymb-like cyme at the end of the branches; calyx campanulate-funnel-shaped, smooth, about 3 lin. long or longer, indistinctly puberulous or glabrous; corolla-tube included, the lobes about half as long as the calyx; stamens 4, long-exserted; drupes elliptically ovoid, the size of a pea, blunt with a mucro, glabrous, seated on the dilated funnel-shaped, irregularly-toothed calyx.

Hab.—Chittagong; also Ava and Pegu.—Fr. Nov.-Dec.

Remarks.—Wood uniformly pale brown, rather light, coarse-fibrous, takes an indifferent polish.

5. **C. subcordata,** Lamk.—A large evergreen shrub or small tree, all parts glabrous; leaves broadly ovate or oval, at the blunt base often unequal, on a slender petiole 1-1½ in. long, acute or blunt, 3-5 in. long, chartaceous, entire or waved, glabrous; flowers large and showy, brick-red, on short slender pedicels, forming a short-peduncled, glabrous, dichotomous cyme at the end of the branchlets; calyx tubular-bell-shaped, ⅓ in. long, smooth and glabrous, bluntish and shortly lobed, enlarging and entirely enclosing the drupe; corolla glabrous, funnel-salver-shaped, the tube nearly an inch long, striate, the limb nearly an inch across, 6-lobed, the lobes crumpled, short, darker veined; stamens 6; style 6-cleft; drupes the size of a cherry, entirely enclosed in the smooth calyx prolonged into a short tube.

Hab.—Coasts of the Andamans; also Southern Tenasserim.—Fl. Fr. Feb.-March.

EHRETIA, L.

Calyx deeply divided into 5 segments. Corolla more or less rotate with a short tube, imbricate in bud. Stamens inserted in the tube; anthers exserted or rarely almost included. Ovary 2-celled with 2 ovules in each cell, or 4-celled with solitary ovules; style terminal, more or less 2-lobed or forked, the lobes entire with a prominent ring. Fruit a drupe, the endocarp forming two 2-seeded or four 1-seeded pyrenes. Testa of seeds membranous. Albumen usually scanty. Cotyledons ovate, not folded.—Trees or shrubs, with entire or toothed leaves. Flowers small, in panicles or cymes, either terminal in the axils of the upper leaves or rarely all axillary. Bracts small.

× *Leaves entire; pyrenes* 4, 1-*seeded.*

Leaves, especially beneath, pubescent. . . . . *E. aspera.*
Leaves glabrous . . . . . *E. lævis.*

× × *Leaves sharply serrate; pyrenes* 2, 2-*seeded.*

Calyx- and corolla-lobes very blunt . . . . . *E. serrata.*

1. **E. aspera,** Roxb.; Bedd. Sylv. Madr. 146.—A straggling shrub, all softer parts more or less pubescent and somewhat roughish;

leaves obovate to obovate-oblong, tapering or almost cuneate at the base, on a 2-3 lin. long pubescent petiole, 1-1½ in. long, blunt or somewhat acute or retuse, entire, firmly membranous, shortly pubescent beneath, above sprinkled with short hairs and more or less glabrescent; flowers rather small, white, on very short pedicels or the ultimate ones sessile, in pubescent forked racemes, forming a peduncled cyme at the end of the branchlets or axillary; calyx about a line long, pubescent; corolla rotate-funnel-shaped, nearly 4 lin. in diameter, the lobes soon reflexed, elliptical, blunt or rather acute; drupes globular, the size of a pepper-kernel, smooth, red, somewhat 4-lobed, containing four 1-seeded pyrenes.

HAB.—AVA.—Fr. Sept.

2. **E. lævis,** Roxb.; Bedd. Sylv. Madr., t. 246; Brand, For. Fl. 340, t. 42.—A tree (40—50 + 15—20 + 3—4), shedding leaves in H.S., all parts glabrous and the leaf-buds often sticky; leaves variable, elliptical to obovate, acute to acuminate at the base, 1-4 in. long, bluntish acuminate, apiculate or blunt, entire, chartaceous, glabrous, the very young ones often somewhat sticky; flowers snow-white, sessile or nearly so, in forked one-sided spikes forming a peduncled, glabrous or rarely minutely puberulous, often sticky, compound cyme in the axils of the leaves or at the end of the branchlets; calyx smooth and sticky, or puberulous, about ½ lin. long; corolla rotate, about 2½ lin. in diameter, the lobes lanceolate, acute; drupes depressed-globular, the size of a pepper-kernel, 4-lobed, blackish, with four 1-seeded pyrenes.

Var. 1, **lævis proper:** the leaf-buds, inflorescence and calyces minutely tawny-puberulous.

Var. 2, **glutinosa:** the same parts quite glabrous and sticky, or rarely the calyx minutely puberous.

HAB.—Var. 1: in the forests of South Andaman; var. 2: frequent in the open and dry forests of Pegu and Martaban, and still more frequent in Prome.—Fl. Feb.-March.—l.—SS.=CaS. Dil. Metam.

REMARKS.—Wood pale brown, heavy, fibrous, but rather close-grained, the sapwood lighter coloured and soft, soon attacked by xylophages.

3. **E. serrata,** Roxb.; Brand. For. Fl. 339.—An evergreen tree (30—40+15—20+3—4), all parts glabrous or the young branchlets puberulous; leaves oblong-lanceolate to lanceolate, acute at the base, on a slender petiole up to an in. long, 3-4 inch long, acute or acuminate, sharply serrate, chartaceous, glabrous; flowers white, sessile or nearly so, in small clusters, forming an ample, puberulous, thyrsoid panicle at the end of the branches and in the axils of the upper leaves; calyx glabrous, nearly a line long, the lobes elliptical, blunt; corolla about 2 lin. across, the lobes elliptical, blunt;

drupes the size of a small pea or pepper-kernel, sappy, smooth, red, containing two 2-celled pyrenes.

HAB.—Chittagong; also hills of Ava.—Fl. May.

REMARKS.—Wood tough, rather light, durable, greyish, streaked, fibrous, but close-grained, takes fine polish. Used for handles.

RHABDIA, Mart.

Calyx 5- (very rarely 6-) parted, the lobes equal or nearly so. Corolla bell-shaped or rotate-bell-shaped, with a short tube, the limb 5- (rarely 6-) -cleft. Stamens 5, inserted in the corolla-tube, exserted or included; anthers oblong, basifix. Ovary ovate, 4- or rarely 6-celled, the cells with a solitary ovule; style simple; stigma capitate and obscurely 2-lobed. Drupe with 4 (rarely 6) 1-seeded pyrenes. Seeds albuminous.—Creeping or prostrate shrubs, with crowded, small, alternate leaves. Flowers small, in poor-flowered terminal cymes.

1. **R. viminea,** Dalz.; Brand. For. Fl. 341.—A prostrate, creeping or ascending shrub of several feet in length, the young parts sparingly silky-pubescent; leaves cuneate-oblong to obovate-linear, on a very short pubescent petiole or almost sessile, ½-1 in. long, blunt or somewhat acute, entire, thick-membranous, sparingly appressed-pubescent and glabrescent; flowers reddish lilac, on very short pubescent pedicels, by 3 to 5 in poor, small, very short pedunculed, appressed-pubescent cymes terminating the lateral branchlets; calyx pubescent, the lobes subulate-lanceolate; corolla glabrous, the lobes ovate, blunt; drupes the size of a small pea, sappy and very glossy, crimson, containing four 1-seeded pyrenes.

HAB.—Common all over Burma from Ava and Martaban down to Upper Tenasserim, in sandy or rocky beds of streams.—Fl. Fr. C.S. and H.S.—l.—SS.=petrophilous.

CONVOLVULACEÆ.

Flowers regular. Calyx of 5 sepals much imbricated in bud, rarely 5-toothed or -lobed. Corolla bell- or funnel-shaped, rarely rotate or salver-shaped, the limb 5-lobed or angular, folded or very rarely imbricate in bud. Stamens 5, inserted in the corolla-tube and alternating with the corolla-lobes, usually unequally long; anthers versatile or nearly erect, 2-celled, the cells opening lengthwise. Ovary free, 2-3-4-celled, rarely divided into 2-4 distinct carpels, with 1 or 2 erect or ascending ovules in each cell or carpel, or 1-celled with 2 or 4 ovules; style simple or more or less divided into 2 entire or 2-cleft branches or styles. Fruit either a capsule opening in as many or twice as many valves as there are cells and leaving the

dissepiments attached to the axis, or opening transversely or irregularly, or an indehiscent berry. Seeds erect, with a membranous or coriaceous testa. Albumen scanty or none. Cotyledons usually much folded, rarely straight or wanting.—Shrubs or herbs, usually twining or creeping, rarely trees or leafless parasitic twiners, with usually milky juice. Leaves alternate, simple or divided. Flowers variously arranged, axillary or terminal. Bracts and bractlets usually small or deciduous, rarely large and persistent.

An order of which about 70 species occur in Burma. The milky juice of most species is strongly purgative. Scammony is derived from *Convolvulus Scammonia*, and a similar product comes from *Ipomœa tuberosa*, *Pharbitis cathartica*, *Piptostegia* and others. The best sort of jalap is obtained from *Exogonium Purga*, and there are many other species, Indian as well as American, the root of which yields an inferior sort of jalap. *Convolvulus dissectus* is rich in prussic acid. But edible roots are also produced by species of this order, and more especially from *Batatas edulis*, the common sweet potato, and from *Batatas jalapa*.

* *Corolla-lobes 2-cleft; stigma almost sessile.*
Ovary 1-celled, 4-ovuled; stigma large, globose; fruit a berry . *Erycibe.*
* * *Corolla-lobes entire or retuse; style longer or shorter, simple or 2-cleft, or the styles distinct.*
× Fruit an indehiscent berry.
Ovary 4-celled, the cells 1-ovuled; stigmas 2, linear . . . *Rivea.*
Ovary 4-celled, the cells 1-ovuled; stigma globose didymous or 2-globose . . . . . *Argyreia.*
Ovary 2-celled, the cells 2-ovuled; stigma didymous-globose . *Lettsomia.*
× × Fruit a capsule, with a thin or hard pericarp valvately opening, or berry-like and the pericarp very thin and rupturing irregularly.
+ Bracts and bractlets deciduous, often small.
† Styles 2, distinct or deeply 2-cleft.
Ovary 2-celled, the cells 2-ovuled; stigmas capitate; sepals not changed in fruit, or the outer ones enlarging . . . *Breweria.*
†† Style simple, the stigmas capitate to filiform.
○ Sepals not, or very little enlarged in fruit; capsule 2-4-celled.
Ovary-cells 2- or 1-ovuled; stigma globose or biglobose; capsule 2-4-valved, rarely opercled or irregularly bursting; twiners . *Ipomœa.*
○ ○ Sepals all or 3 of them much enlarged and wing-like in fruit; capsule 1-celled, 1-seeded.
Ovary 2-celled, the cells 2-ovuled; style entire or 2-cleft, stigmas capitate . . . . . *Porana.*
++ Bract leafy-enlarged in fruit, conspicuous.
Corolla deeply 5-lobed; styles 2; capsule 4-8-valved, adnate to near the centre of the bract; scandent shrubs . . . *Neuropeltis.*

ERYCIBE, Roxb.

Sepals 5, imbricate. Corolla rotate, with a short tube; limb deeply 5-lobed, the lobes deeply 2-lobed with the lobes involute,

closely folded and twisted-imbricate in bud. Stamens 5. Ovary 1-celled, with 4 erect ovules; stigma sessile, large and thick, 5- or 10-furrowed, divisible into two. Berry indehiscent, by abortion usually 1-seeded.—Large scandent shrubs, with entire coriaceous leaves. Flowers small, yellow, in short racemes, cymes or clusters, either all axillary, or the upper ones passing into a leafless terminal panicle.

* *Flowers clustered.*
Leaves strongly and prominently nerved and veined . . . *E. glomerata.*
* * *Flowers in cymes arranged into raceme-like elongate panicles.*
× Leaves glossy on both sides, not glaucescent.
Leaves very coriaceous, the lateral nerves faint, the transverse veination entirely absent or obscure . . . . . *E. coriacea.*
Leaves thin-coriaceous, the lateral nerves and net-veination thin but conspicuous . . . . . *E. paniculata.*
× × Leaves opaque on both sides, glaucescent.
Panicle and sepals only sparingly silk-hairy, glabrescent . . *E. glaucescens.*

1. **E. glomerata,** Wall.—An evergreen erect shrub, the young shoots rusty or tawny hirsute; leaves rigidly but rather thin-coriaceous or almost chartaceous, on a thick tawny-villous petiole 1-3 lin. long, elliptically oblong to lanceolate, acute at the base, apiculate, especially while young hirsute or villous on the prominent sharp nerves beneath, in drying turning reddish or brown and somewhat bullate-wrinkled above, the net-veination conspicuous, but thin and lax; flowers small, yellow, almost sessile, in small, villous, dense, sessile clusters arising from the leaf-axils or from above the scars on the older branches, very rarely the clusters developing into small, short-peduncled, axillary cymes; sepals appressed tawny-villous, orbicular, about a line long; petals appressed fulvous silky-villous outside, about 2 lin. long, produced into 2 rotundate concavely-involute glabrous appendages much folded in the bud; berries oblong or elliptically oblong, nearly ¾ in. long, glabrous, 1-seeded.

Hab.—Apparently not rare in Upper Tenasserim.—Fl. Jan.-March; Fr. March-Apr.

2. **E. coriacea,** Wall.—A large scandent evergreen shrub, the young shoots covered with a fugaceous tawny or rusty tomentum; leaves thick-coriaceous, obversely lanceolate to lanceolate and elliptical, on a strong petiole 3-5 lin. long, apiculate or shortly and bluntish acuminate, 2½-5 in. long or smaller, smooth and glossy on both sides, the lateral nerves thin, the net-veination obsolete or nearly so; flowers small, yellow, very shortly and stoutly pedicelled, in dense, almost sessile, tawny and rusty-tomentose cymes collected in short, more or less dense or rarely lax racemes or raceme-like panicles in the axils of the upper leaves and at the end of the

branches; sepals orbicular, about a line long, thinly greyish or tawny-pubescent outside; corolla rotate, about 3 lin. in diameter, appressedly tawny silk-hairy, the lobes produced into oblong, glabrous appendages folded in the bud; berries elliptically ovoid, glabrous, ⅓ in. long, black.

Hab.—Apparently frequent all over Tenasserim; also Chittagong.—Fl. Fr. Feb.-March.

3. **E. paniculata,** Roxb.—A large evergreen scandent shrub, the young branchlets more or less rusty-villous or tomentose; leaves from oblong and obversely lanceolate to elliptical, on a strong petiole 2-3 lin. long, acute or rarely rounded at the base, bluntish acuminate to apiculate, 2-3½ in. long, coriaceous, while very young covered with a very fugaceous rusty-brown down, soon quite glabrous and more or less glossy on both sides, the lateral nerves and transverse veination thin but conspicuous; flowers small, yellow, on rusty-villous pedicels about 1-1½ lin. long, in small cymes forming rusty-villous racemes in the axils of the leaves and collected into elongate panicles at the end of the branches or of the axillary branchlets; sepals densely rusty silky-villous, about 1½ lin. long, concave-orbicular; corolla rotate, with a very short tube, densely rusty-villous outside, the lobes nearly 1½-2 lin. long, terminating into 2 rotundate, bright yellow, glabrous appendages folded in in bud; berries glabrous, ovoid, bluish black, the size of a large pea, 1-seeded.

Hab.—Tenasserim; Ava.

4. **E. glaucescens,** Wall.—A scandent evergreen shrub, the young shoots slightly appressed rusty-pilose; leaves obversely lanceolate to elliptically oblong and elliptical, on a rather slender petiole 2-4 lin. long, apiculate or bluntish acuminate, usually acute at the base, 2-3½ in. long, coriaceous, glabrous, more or less glaucescent and opaque on both sides; flowers small, yellow, on 2-3 lin. long sparingly fulvous-pubescent pedicels, in small short-peduncled cymes usually collected into elongate, sparingly fulvous-pubescent, glabrescent, raceme-like panicles in the axils of the leaves and at the end of the branches; sepals rusty-pilose outside or almost glabrous, orbicular, about a line long; petals fulvous-villous outside, about 2 lin. long, at the apex produced into 2 rounded, glabrous, yellow appendages folded in in bud; berries not known.

Hab.—Pretty frequent in the tropical forests of Martaban and Upper Tenasserim.—Fl. Feb.-March.—s: l.—SS.=Metam.

ARGYREIA, Lour.

Sepals equal or the inner ones much narrower, unchanged or enlarged in fruit. Corolla funnel-shaped, the plaited limb angular

or 5-lobed. Stamens included. Disk annular, entire or sinuately 5-lobed. Ovary perfectly 4-celled, with a solitary ovule in each cell; style filiform with a didymously globose stigma. Berry fleshy and indurating, usually 1-seeded by abortion.—Twining shrubs or undershrubs, with ample simple leaves. Flowers showy, in poor cymes. Bracts small or almost leafy.

Bracts up to ½ in. long, persistent during flowering; flowers pink; seeds glabrous . . . . . *A. Zeylanica.*

Bracts small and deciduous; flowers white or pale purplish; seeds densely brown-puberulous, hairy round the hilum . . . *A. tiliæfolia.*

1. **A. Zeylanica** (*Ipomœa Zeylanica*, Gaertn.).—*O-ná-kop-nway.*—An extensive twiner, the young shoots sparingly appressed-hairy; leaves ovate to elliptically ovate, sinuate or almost cordate at the base, acute, 3 to 5 in. and sometimes up to a foot long and broad, membranous, entire, glabrous above, beneath, especially on the nerves, very sparingly hairy; flowers rather large, pink, shortly pedicelled, forming a long (5-8 in.) peduncled, slightly appressed-hairy, bracted cyme in the axils of the leaves, or sometimes the inflorescence reduced to a few flowers only; bracts persistent during flowering, linear or usually spatulate-linear, up to ½ in. long; calyx-lobes linear-oblong, ⅓ in. long, slightly appressed-hairy, the inner ones acute; corolla funnel-bell-shaped, with a wide tube about 1½ in. long and contracted near the base, the lobes of the limb triangular, blunt; capsules berry-like, yellow, smooth, the size of a pea, usually 1-seeded; seed almost globose, grey, smooth and glabrous.

Var. 1, **populifolia**: all parts nearly glabrous.

Var. 2, **hirsuta**, Thw.: all parts, also the bracts and calyces, densely appressed-hirsute.

Var. 3, **peduncularis**: leaves not or almost not cordate at the base, more elliptic, the petiole often longer than the blade.

Hab.—Not rare in the moister mixed forests, especially the upper ones, of the Pegu Yomah; Ava.—Fl. C.S.—s: l.—SS.=SiS.

2. **A. tiliæfolia**, Wight.—*Toung-ká-zun-kyee.*—An extensively twining shrub, with twisted and buttressed stems of 3 in. thickness, the young parts greyish pubescent; bark rough; cut milky; leaves cordate-rotundate, on a puberulous or pubescent petiole 1-2 in. long or shorter, usually acute or shortly acuminate, rarely blunt, more or less pubescent beneath, 2-4 in. long, chartaceous, the lateral nerves numerous and rather straight with strong parallel veins between; flowers large, showy, usually white or pale purplish, with a purple throat, on pubescent or greyish-tomentose pedicels 3-5 lin. long, usually by 3-4 or fewer terminating the short branches of the 2-forked or dichotomously branched more or less pubescent stout peduncle of 2-2½ in. in length; calyx nearly ½

in. long, grey-tomentose, the sepals elliptical, blunt or somewhat acute; corolla glabrous, funnel-shaped, 1-1½ in. deep, the lobes almost obsolete, bluntish; stigmas 2, rotundate; berry entirely concealed in the calyx, the size of a cherry; seeds 4-1, covered with a dense, fine, brown down, hairy round the hilum.

Hab.—Frequent in all leaf-shedding forests, and more especially in jungles along choungs, all over Burma as far south as Upper Tenasserim.—Fl. C.S.

Remarks.—Wood rather light and useless, porose, greyish brown, the annual rings broad.

LETTSOMIA, Roxb.

Sepals ovate, orbicular or lanceolate, usually spreading under the fruit. Corolla bell- or funnel-shaped, the limb shortly lobed, plaited in bud. Stamens included or exserted. Disk annular. Ovary 2-celled, with 2 ovules in each cell; stigma didymously globose. Berry indehiscent, dry or sappy.—Large climbers, with ample simple leaves. Flowers small or large, cymose or capitate, forming bracted axillary cymes or corymbs.

All parts tawny-appressed hirsute, the flower-heads spreadingly so; corolla an inch deep . . . . . *L. capitata.*
All parts greyish or whitish tomentose; corolla about ⅓ in. deep . *L. aggregata.*

1. **L. capitata,** Bth. and H.f.—A lofty twiner with woody stems, all softer parts densely covered with tawny-silvery appressed hairs; leaves cordate-ovate, on a tawny-hirsute petiole 1-2 in. long, acuminate, entire, 4-6 in. long, membranous, densely and thickly hirsute from appressed tawny or golden hairs, more or less glabrescent above, the lateral nerves numerous, parallel; flowers rather large, pale lilac or rose-coloured with a purple throat, sessile, and forming by 3 or rarely more a bracted head on a spreadingly hirsute axillary peduncle 2 to 4 in. long; outer bracts ovate, very hirsute outside, about as long as the calyx; sepals ½ in. long, very hirsute outside, the outer ones obovate-oblong; corolla funnel-shaped, about an inch deep, on the outside hirsute except on the folds, the lobes sinuate and very shallow; stamens inserted above the base of the corolla-tube, the filaments pubescent towards the base; berries indehiscent, globular, the size of a small pea, glabrous, much shorter than the sepals; seeds usually 4, trigonously oval, grey, smooth and glabrous.

Hab.—Frequent in the mixed forests, especially the upper ones, preferring courses of choungs, all over Burma from Chittagong and Ava down to Tenasserim.—Fl. close of R.S. and C.S.—s: l.—SS.=∞.

2. **L. aggregata,** Roxb.—A large twiner, all softer parts greyish or whitish tomentose; leaves cordate to cordate-ovate, on a rather strong tomentose petiole 1-2 in. long, acute or blunt,

mucronate, entire, 3-5 in. long, chartaceous, above green and sparingly appressed-hairy, beneath densely whitish tomentose; flowers small, pale rose-coloured, very shortly pedicelled, forming white-tomentose, shorter or longer (1-2½ in.) peduncled, axillary cymes, while young densely and compactly bracted; bracts deciduous after flowering, obovate, not much exceeding the calyx, thickly white-tomentose; sepals about 3 lin. long, very unequal, the outer ones broadly obovate, the inner ones somewhat shorter and narrower; corolla only about ⅓ in. long, campanulate-funnel-shaped, with a wide glabrous tube, the lobes obversely cordate with an elongately triangular centre, densely hirsute outside; filaments inserted with a villous base below the throat of the corolla; berries globose, crimson, smaller than the spreading enlarged sepals (which are lively blood-coloured within) and about the size of a pea, smooth, 2-celled, the cells 2-seeded; seeds smooth and glabrous, greyish.

Hab.—Ava; Tenasserim.

IPOMŒA, L.

Sepals 5, imbricate. Corolla bell- or funnel- to almost salver-shaped, the limb spreading, angular or rarely deeply lobed, folded in bud. Ovary 2-, or incompletely 3- or 4-celled, with 2 ovules in each cell; style filiform; stigma entire and capitate or bi-globose, or rarely the lobes almost ovate. Fruit a dry dehiscent capsule; seeds glabrous or variously clothed.—Twining, creeping, or rarely almost erect herbs or undershrubs, with entire, lobed or digitate leaves. Flowers often showy, solitary, or in more or less developed axillary cymes.

* *Flowers salver-shaped, white; stamens exserted.*

Seeds glabrous; of the sepals the 2 outer ones abruptly subulate . *I. Bonanox.*
Seeds velvety-tomentose; sepals all acute and nearly conform . *I. Yomæ.*

* * *Corolla bell-, funnel- or funnel-bell-shaped.*

× Corolla rose-coloured.

Branches terete, pubescent; seeds shortly brown-tomentose . . *I. campanulata.*

× × Corolla white.

Branchlets 3-cornered and 3-winged; seeds glabrous . . . *I. Turpethum.*

× × × Corolla yellow.

Glabrous; calyx scarious, glabrous; seeds softly pilose-fringed . *I. xanthantha.*
Spreadingly yellowish hairy; calyx hirsute; seeds glabrous . *I. vitifolia.*

1. **I. Bonanox**, L.—*Nway-ka-sun-á-phyoo.*—A large twiner, all parts glabrous or the young shoots appressed-hairy; branches smooth or spinulose-muricate; leaves cordate, sinuate at the base, on a glabrous petiole 1-3 in. long, finely acuminate, entire or sometimes exhibiting a tendency to become 3-lobed, membranaceous, 2-4 in. long, glabrous, or beneath sparingly appressed-hairy; flowers large and showy, white, on thick pedicels about ½ in. long,

solitary or sometimes very loosely spiked on the axillary peduncle of very variable (from a few lines to 4 in.) length; sepals glabrous, the 2 outer ones elliptically oblong, abruptly terminated by a long subulate point, the inner ones about $\frac{1}{3}$ in. long, ovate, mucronate; corolla salver-shaped, with a slender tube varying from $3\frac{1}{2}$-2 in. in length, glabrous, the limb almost entire, 2-3 in. in diameter; stamens inserted high up in the tube near the throat and exserted, glabrous; ovary 2-celled, the cells 2-ovuled; capsule three times the length of the enlarged broad sepals, ovoid, acuminate, the size of a cherry, glabrous; seeds ovoid-oblong, glabrous.

Hab.—Frequent in the mixed forests and amongst shrubbery along river sides, all over Chittagong, Pegu, and from Martaban down to Tenasserim.—Fl. Fr. ∞.—s: l.—SS.=∞.

2. **I. Yomæ,** Kz.—A large twiner, the younger parts appressed-hairy; branchlets armed with short compressed prickles; leaves cordate, on a pubescent petiole 2-1 in. long, entire, long-acuminate, membranous, 4-5 in. long, almost glabrous above, beneath sparingly appressed pilose; flowers unknown; fruiting pedicels very thick, about an inch long, glabrous, solitary on the axillary pubescent peduncle of a few lines to nearly an inch long; fruiting sepals ovate, acute, nearly all conform, glabrous, nearly $\frac{1}{2}$ in. long; capsules ovoid, scarcely longer than the enlarged sepals, glabrous, 2-celled, the cells 2-seeded; seeds trigonously obovoid, velvety-tomentose, villously fringed on the sides, dark brown.

Hab.—Here and there in the lower and upper mixed forests of the Pegu Yomah.—Fr. C.S.—s.—SS.=SiS.

3. **I. campanulata,** L.—An extensive twiner, the younger parts softly puberulous; leaves cordate to cordate-ovate, on a puberulous petiole 2-4 in. long, shortly and usually bluntish acuminate, entire, 2-4 in. long, membranous, beneath softly but minutely puberulous; flowers large, rose-coloured, on about $\frac{1}{2}$ in. long pedicels much thickening with ripening of the fruit, solitary on the axillary puberulous peduncles of about the length of the pedicels themselves; sepals glabrous, rotundate, very blunt, about 4 lin. long, the inner ones somewhat larger; corolla funnel-bell-shaped, about 2 in. deep, glabrous; capsules dry, ovoid, the size of a cherry, quite included in the enlarged sepals, 2-celled, with usually 2 seeds in each cell; seeds trigonously ovoid, the size of a pea, shortly brown-tomentose.

Hab.—Not unfrequent in shrubbery on the beaches of the coasts of the Andamans; also Chittagong.—Fl. Fr. C.S. and H.S.—l.—SS.=Aren. Ca.

4. **I. Turpethum,** R. Br.—An extensive twiner, the younger parts softly pubescent, the branchlets 3-cornered and membranously 3-winged; leaves varying from cordate to ovate and lanceolate,

entire or rarely produced at the base into 2-4 short lobes, sometimes also repand-angular, on a pubescent petiole 1-½ in. long, acuminate, membranous, softly pubescent (especially beneath), 2-4 in. long or longer; flowers large, white, on strong pubescent pedicels about ½-⅓ in. long, by 3-4 or fewer and racemose, or solitary on the axillary peduncle, which varies in length from ½-2 inches; bracts ovate to ovate-lanceolate, acuminate, membranous, softly pubescent, ½-1 in. long, deciduous; sepals enlarging in fruit, pubescent, broadly ovate, acute, about ¾-½ in. long, the inner ones shorter and narrower; corolla broadly bell-shaped, glabrous, about 1-1½ in. deep; anthers much twisted after shedding of the pollen; filaments glabrous, inserted above the constriction of the tube; capsules dry, hyaline-chartaceous, the size of a small cherry, globose, smooth, quite enclosed in the enlarged sepals, 2-celled, with usually 2 seeds in each cell; seeds almost globose, jet black, glabrous, opaque.

Hab.—Common in all leaf-shedding forests and more especially in the savannahs and savannah forests, along river sides, etc., all over Burma from Chittagong and Ava down to Tenasserim.—Fl. R.S. and C.S.; Fr. H.S.—s+l.—SS.=∞.

5. **I. xanthantha,** Kz.—*U-men.*—A large twiner, all parts glabrous; leaves ovate to lanceolate, rounded or almost acute at the base, on a glabrous membranously bordered petiole ½-2 in. long, acuminate to bluntish, 2-6 in. long, chartaceous, glabrous, the nervature and transverse veination beneath rather strong; flowers large, yellow, on glabrous or puberulous pedicels considerably thickening upwards and forming a short raceme on a short (½-1 in. long) glabrous or puberulous axillary peduncle; sepals scarious, glabrous, fully ½-⅔ in. long, ovate, acute; corolla bell-shaped, 1½ in. long, densely appressed silk-hairy outside on the plaits; filaments inserted with a broader puberulous base to the end of the broad constriction of the corolla-tube; anthers screw-like twisted; capsules globose, the size of a small cherry, glabrous; seeds (quite unripe) fringed along the margins with dense, grey, soft hairs.

Hab.—Not unfrequent in the mixed and dry forests, all over Prome and Pegu; less frequent in the drier mixed forests of Martaban.—Fl. H.S.; Fr. probably begin. of R.S.—l.—SS.=petrophilous, *CaS.*

6. **I. vitifolia,** Sw.—*Kya-hin-ka-lae-nway.*—A large extensive twiner, the softer parts spreadingly yellowish hairy; leaves palmately 5- to 3-lobed, sinuate or sinuately cordate at the base, on a spreadingly hairy petiole 2-½ in. long, membranous, more or less hirsute on both sides, the lobes acuminate or acute, or the lower ones blunt to rounded; flowers large, bright yellow, on slender spreadingly hirsute pedicels of ⅓-½ in. in length, by 5 or fewer, forming a longer or shorter peduncled axillary cyme, or sometimes also solitary; sepals spreadingly hirsute, membranous, indurating

and enlarging under the fruit, the outer ones oblong, blunt, about ½ in. long, the inner ones usually by ⅓ longer and narrower, glabrous; corolla funnel-bell-shaped, about 1½ in. deep, glabrous; filaments inserted above the constriction of the tube; capsule globose, the size of a small cherry, glabrous, hyaline-chartaceous, quite enclosed in the enlarged sepals, 2-celled; seeds triangular-oval, black, glabrous, opaque.

Hab.—Common in all forests, especially the tropical ones, and in shrubbery along river sides, etc., all over Burma.—Fl. C.S.; Fr. H.S.—s : l.—SS.=∞.

PORANA, L.

Sepals 5, imbricate in bud, all or three of them more or less enlarging and more or less spreading under the fruit. Corolla bell- or funnel-bell-shaped, the limb angular and 5-lobed, folded in bud. Stamens 5, inserted at the base of the corolla-tube, very short or long, but not exserted. Ovary 2-1-celled, with 2 or 4 ovules; style entire or 2-cleft, the stigmas globular. Capsule indehiscent, usually 1-seeded by abortion.—Twining herbs or shrubs, with entire leaves. Flowers small or large, usually in terminal panicles. Bracts small, rarely large and leafy.

* *Style 2-cleft; all the 5 sepals enlarged in fruit and stellately spreading; corolla small.*

Panicles without floral leaves; sepals about 2 lin. long, oval, blunt; capsule mucronate . . . . . *P. volubilis.*

** *Style simple, only 3 of the sepals fairly enlarged, erect or erect-spreading; flowers white.*

Corolla about 2 lin. across; fruiting sepals 1-nerved . . . *P. paniculata.*

Corolla-limb about an inch in diameter; fruiting sepals 5-nerved at the base . . . . . *P. spectabilis.*

1. **P. volubilis,** Burm.—An extensively twining shrub, the shoots slightly appressed-pubescent; leaves ovate, rounded or rarely shallowly cordate at the base, on a slender glabrescent petiole ½-¾ in. long, more or less bluntish acuminate, 1½-2½ in. long, entire, glabrous, membranous; flowers small, white, on slender, sparingly appressed-hairy pedicels about 2 lin. long, in slender, axillary and terminal, slightly pubescent panicles collected into larger ones at the end of the branches; sepals about 2½ lin. long, oboval, glabrous, or sometimes ciliate on the blunt apex; corolla bell-shaped, the limb 5-cleft, about 3 lin. in diameter; ovary 2-celled, the style unequally 2-cleft; filaments long, the anthers protruding from the mouth of the corolla; fruiting sepals ovate-lanceolate, probably many-nerved, about ⅓ in. long, chartaceous; capsules globular, mucronate, the size of a small pea, smooth, brown.

Hab.—Burma, probably Tenasserim.

2. **P. paniculata,** Roxb.—A large twining or spreading shrub,

all softer parts more or less greyish or tawny-pubescent; leaves cordate-ovate to ovate, on a slender grey-pubescent petiole up to an inch long, entire, thick-membranous, softly and almost velvety pubescent (especially beneath); flowers small, white, on thickly pubescent 1½-2 lin. long pedicels, fascicled and forming axillary and terminal grey-pubescent panicles; sepals densely greyish or whitish pubescent, linear-lanceolate, acute, about ½ a line long; corolla funnel-bell-shaped, about 3 lin. long, pubescent outside on the plaits, the limb about 2 lin. across, shortly and roundedly 5-lobed; filaments puberulous, very short and included; style very short, with a 2-lobed stigma, only 3 of the sepals much enlarged in fruit (the 2 others entirely reduced), erect-spreading, oblong, blunt with a mucro, about ¾-1 in. long, chartaceous, puberulous, 1-nerved and laxly net-veined; capsules globose, the size of a small pea, with a thin-chartaceous, sparingly hairy pericarp; seed solitary, globose, black, smooth.

Hab.—Ava, apparently frequent.—Fl. C.S.; Fr. H.S.—l.

3. **P. spectabilis,** Kz.—An extensively twining evergreen shrub, all softer parts yellowish pubescent; leaves ovate, or rarely at the base shallowly sinuate-cordate, up to 2-4 in. long, on a densely pubescent petiole ½-1 in. long, acute or bluntish with a mucro, entire, thick-membranous, densely pubescent, especially beneath; flowers rather large, white, on densely pubescent 2-3 lin. long pedicels, forming tomentose lax racemes terminating the axillary rather short branchlets; sepals linear, about 2 lin. long, thickly pubescent; corolla funnel-bell-shaped, nearly an inch long, the outside, especially of the tube, puberulous, the limb 5-angular, ¾-1 in. across; filaments glabrous, short and included, inserted at the constriction of the tube; style very long, with a capitate stigma; only three of the sepals equally enlarged (the 2 others entirely suppressed), up to 1½ in. long, obversely linear-oblong, blunt, chartaceous, puberulous, at the base 5- further up 3-nerved, transversely veined; capsule (unripe) almost globose, the size of a pea, stylose-acuminate, appressed-hairy and glabrescent.

Hab.—Not unfrequent in the tropical forests of Martaban.—Fl. March-Apr.; Fr. Apr.-May.—s : l.—SS.=Metam.

NEUROPELTIS, Wall.

Sepals 5, persistent, imbricate. Corolla funnel-shaped, 5-parted, the lobes entire, folded in bud. Ovary 2-celled, with 1 or 2 erect ovules in each cell; styles 2, the stigmas reniform-capitate, much lobulate. Capsule dry, 4- or incompletely 8-valved, adnate to near the middle of the very much enlarged, chartaceous, nerved floral bractlet, 1-seeded by abortion.—Scandent shrubs, with entire

leaves. Flowers small, in simple or compound racemes. Bracts none. Bractlets close to the sepals, leaf-like enlarging in fruit.

1. **N. racemosa,** Wall.—A large scandent shrub, all parts glabrous; leaves elliptical to elliptically and ovate-oblong, usually acute at the base, on a glabrous petiole ½ to nearly an inch long, shortly acuminate, entire, coriaceous, 2½-4 in. long, glabrous; flowers small, white, on short, rusty silk-hairy pedicels, supported by a rotundate, acute or retuse, thickly rusty-tomentose bractlet, forming 1 or 2 slender, rusty-pubescent racemes in the axils of the leaves and shorter than them; sepals appressed fulvous-pubescent, broadly rotundate, about 1½ lin. long, the inner ones broader and retuse; corolla rotate-bell-shaped, about 3 lin. across, appressed-pubescent outside, deeply 5-lobed, the lobes lanceolate, acute; stamens 5, the filaments inserted with a villous base at the sinuses of the lobes; ovary tawny-villous; capsules 4- or incompletely 6-8-valved, ovoid-globose, the size of a small pea, longer than the rounded sepals, very minutely and shortly appressed-silky, inserted with the short pedicel below the middle of the enlarged floral bractlet, which is chartaceous, 1-1¼ in. each way, cordate-rotundate, more or less sinuate at the apex, adnate to the slender pedicel for about one-third of its length, arcuately nerved and laxly net-veined, glabrous; seed solitary by abortion, almost globose, black, glabrous.

Hab.—Rare along choungs in the tropical forests along the eastern slopes of the Pegu Yomah; apparently more frequent in Tenasserim.—Fl. Feb.-Apr.—s: l.—SS.=SiS. Metam.

SOLANACEÆ.

Flowers regular or nearly so, hermaphrodite. Calyx 5- rarely 5-10-toothed, -lobed or -cleft, rarely almost entire and truncate, persistent or rarely circumsciss-deciduous beyond the base, often enlarging in fruit. Corolla from rotate to funnel-shaped, plaitedly 4- (rarely 4-10-) -lobed or -cleft, imbricate or twisted in bud. Stamens as many as corolla-lobes and alternating with them; filaments usually very short, or exserted; anthers oblong to linear, erect and connivent, either parallel or more usually tapering upwards and forming a cone round the style, opening in apical pores or transverse slits, rarely dehiscing along their whole length, usually without any prominent connective between the cells. Ovary entire (or rarely consisting of 2-30 distinct carpels), 1-6-celled, each cell with many (or only a solitary) ovules; style and stigma simple, or with as many lobes as there are ovary-cells. Fruit either a drupe with a 1-6-celled putamen (or rarely the drupes distinct with a 2-celled and 2-seeded putamen), or more usually a pulpy berry, or a septicidally opening, 2-valved or at the summit cir-

cumsciss-opening capsule. Seeds compressed. Albumen copious, fleshy. Embryo curved to spiral, rarely straight, with half-cylindrical cotyledons, the radicle terete.—Herbs, shrubs, or rarely soft-wooded trees, with alternate, simple, lobed or pinnate leaves. Stipules none. Flowers solitary or in centrifugal cymes or unilateral racemes, usually at first terminal, but becoming lateral from the elongation of the shoot, rarely axillary. Bracts and bractlets usually none.

Although of no special bearing in forestry, this order is of considerable importance generally. It comprises the potato (*Solanum tuberosum*), tobacco (various species of *Nicotiana*), tomatoes (*Lycopersicum esculentum*) and brinjals (*Solanum melongena*), all plants well known. The herb, and often the fruits, of many *Solaneæ* are more or less poisonous or narcotic. The thorn-apple (*Datura*) is a violent narcotic when taken internally; henbane (*Hyoscyamus*), *Atropa Belladonna*, *Withania somnifera*, and many others are similarly narcotic. Spanish pepper and chillies (*Capsicum*) are a well-known pungent ingredient in many Indian dishes. The fruits of several species of *Physalis* are edible, and usually called country-gooseberries. Of the 22 Burmese species only a few are woody and shrubby, and one South American, soft-wooded tree (*Solanum macranthum*, Dun, *S. Wrightii*, Bth.), is sometimes seen in gardens and usually goes under the name of potato-tree.

* *Fruit a berry.*
○ Fruiting calyx enlarged or not, supporting the berry.
\+ Ovules and seeds very numerous.
Anthers opening longitudinally, with or without apical pores; leaves pinnatisect . . . . . *Lycopersicum.*
Anthers opening longitudinally; leaves simple . . . . *Capsicum.*
Anthers opening by apical pores . . . . . *Solanum.*
\+ \+ Ovules and seeds solitary in the cells.
Anthers almost sessile; ovary 2-celled, the solitary ovules laterally from the septum; seeds concave . . . . . *Gardneria.*
○ ○ Fruiting calyx enlarged and entirely enclosing the berry.
Calyx 5-parted, cordate at the base . . . . . *Nicandra.*
Calyx shortly 5-lobed . . . . . *Physalis.*
* * *Fruit a capsule, opening valvately.*
Calyx tubular, longitudinally fissuring, entirely or only the circumsciss base persistent . . . . . *Datura.*
Calyx more or less bell-shaped, wholly persistent and enclosing the capsule . . . . . *Nicotiana.*

SOLANUM, L.

Calyx 5- (rarely 4- or 6-10-) -toothed or -lobed, or truncate. Corolla rotate or shallowly bell-shaped, 5- or rarely 4-lobed or -angular, folded in bud. Stamens as many as corolla-lobes, the filaments short; anthers linear or oblong, erect and connivent, either parallel or more frequently tapering upwards and forming a

cone round the style, opening at the apex in pores or transverse slits, without any prominent connective between the cells. Fruit a berry, usually 2- rarely 4-celled (*i. e.*, the cells divided by a spurious dissepiment) or rarely several-celled. Seeds several or many, flattened, with a curved or spiral embryo surrounding the fleshy albumen.—Herbs, undershrubs or shrubs, rarely soft-wooded trees, unarmed or variously prickly, with alternate, but often paired, simple or divided leaves. Flowers rarely solitary, usually in terminal or lateral cymes or unilateral racemes.

× *Corolla more or less pubescent or tomentose outside.*
○ Glabrous or only very thinly sprinkled with minute stellate hairs.
Spreading, much armed with long, straight, yellowish prickles; leaves deeply sinuate-lobed; berries the size of a cherry . *S. xanthocarpum.*
Scandent, less armed with recurved prickles; leaves slightly lobed; berries the size of a pea . . . . . *S. trilobatum.*
○○ All parts more or less densely stellate-tomentose.
+ Flowers in a true cyme.
Prickly armed; leaves more or less lobed, pubescent . . . *S. torvum.*
Unarmed; leaves entire, thickly tomentose . . . . . *S. verbascifolium.*
++ Flowers in a raceme often much reduced, rarely solitary.
† Berries quite enclosed in the prickly calyx.
Prickly armed; flowers in a lax raceme; berries the size of a pea *S. involucratum.*
†† Berries free, not enclosed, but only supported by the calyx.
Prickly armed; flowers in a very short raceme; berries 1-1½ in. thick, globular, hirsute or puberulous . . . . . *S. ferox.*
Prickly armed or unarmed, thickly tomentose; fertile flowers solitary, the sterile ones in a very short raceme; berries 3-18 in. long, oval to elongate-cylindrical, smooth . . . . *S. melongena.*
Prickly armed; flowers racemose; berries globular, the size of a pea *S. indicum.*
×× *Corolla quite glabrous.*
○ Calyx 5-merous.
Glabrous shrub; flowers in long racemes, about ⅓ in. across; leaves entire . . . . . *S. spirale.*
Herb, often somewhat pubescent; flowers about 3 lin. across, in umbel-like racemes; leaves often lobed . . . . . *S. nigrum.*
○○ Calyx 10-toothed. Leaves entire.
Pubescent; calyx hirsute . . . . . *S. biflorum.*
Glabrous or nearly so; calyx glabrous . . . . . *S. denticulatum.*

1. **S. trilobatum**, L.—An evergreen, glabrous, scandent, shrubby undershrub, 6-12 ft. long, armed with sharp, recurved, pale-coloured prickles; leaves small, deltoid-ovate, irregularly and bluntish 3- to 5-lobed, on a strongly recurved-prickly petiole ½-1 in. long, blunt, 1-2½ in. long, glabrous or often sprinkled with minute stellate fugaceous hairs, fleshy-membranous, unarmed or with a few recurved prickles on the midrib beneath; flowers rather large, an inch across or somewhat larger, pale lilac, on slender ½-1 in. long unarmed or prickly pedicels, by 2 or several, forming a very short peduncled or sessile terminal or lateral umbel; calyx only about a line long, 5-toothed, stellate-puberulous, unarmed or more usually

sparingly prickly; corolla shallowly rotate-funnel-shaped, wrinkled-plaited, stellate-puberulous outside, the lobes lanceolate, acute; berries globular, the size of a pea, smooth, supported by the small 5-lobed often prickly calyx; seeds rather large, much compressed, orbicular-reniform, minutely granulate.

Hab.—In the tidal forests of Lower Pegu and Arracan.—Fl. Fr.—Feb.-March.—SS.=Sal.

2. **S. torvum,** Swartz.—An erect shrubby perennial, often growing out into a woody shrub 8-12 ft. high, all parts shortly stellate-pubescent and sparingly armed with a few scattered, compressed, sharp prickles; leaves usually paired, more or less ovate, obtuse at the very unequal base, on a stellate-pubescent petiole ½-1 inch long, sinuate or deeply lobed with the lobes blunt or acute, or almost entire, shortly acuminate, the larger ones 3-4, the smaller 2-3 in. long, membranous, densely and shortly stellate and often scurfy pubescent beneath, almost powdery-stellate-puberulous above; flowers rather small, white, on slender 2-3 lin. long pubescent pedicels, forming a short-peduncled pubescent cyme arising laterally or from the axils of the leaves or sometimes from between the opposite petioles; calyx 5-lobed, about 2 lin. long, sparingly puberulous, the lobes ovate-lanceolate, acute; corolla rotate, more than ½ an in. across, stellate-pubescent outside, the lobes lanceolate, acuminate; berries globular, the size of a small cherry, yellow, glabrous, supported by the 5-cleft glabrous calyx; seeds compressed, almost orbicular-reniform, minutely and indistinctly granulate.

Hab.—Common in savannahs, shrubberies, light woods, poonzohs and rubbishy places around villages, all over Burma from Chittagong and Ava down to Tenasserim; also on the Andamans, but here introduced.—Fl. Fr. C.S. and H.S.—l.—SS.=∞.

3. **S. verbascifolium,** L.—An erect shrub, 8-12 ft. high, unarmed, all parts thickly and often scurfy stellate-tomentose; leaves ovate-lanceolate to lanceolate, obtuse or rounded at the base, on a thick scurfy-stellate-tomentose petiole up to ½ in. long, entire, 3-5 in. long, acuminate, thick membranous, above green and shortly and softly stellate-pubescent, beneath whitish or yellowish from a thick often somewhat scurfy stellate tomentum; flowers small, white or very pale blue, on thick tomentose pedicels, forming an erect, rather short-peduncled, terminal or almost terminal, thick-tomentose cyme; calyx densely stellate-tomentose, 5-toothed, the teeth triangular, acute; corolla stellate-tomentose, especially outside, rotate, 5-lobed, the lobes ovate-oblong, only about 2 lin. long or somewhat longer; berries globular, the size of a cherry, supported by the thickly tomentose 5-lobed calyx, fugaciously hairy, yellow; seeds reniform-triangular, compressed, minutely dotted.

HAB.—Frequent in rubbishy places, and shrubbery around villages, in toungyas and poonzohs, along river banks, etc., all over Burma from Chittagong and Ava down to Pegu and Martaban.—Fl. Fr. C.S.—l.—SS.=∞.

4. **S. ferox,** L.—*Sin-ka-de.*—An erect shrub or small tree, 8-15 ft. high, the trunk short, about 1 or 2 in. thick, all softer parts thickly covered with a soft velvety or almost woolly tomentum intermixed with shorter or longer, sharp, compressed, yellowish or brownish prickles; leaves usually paired, on a strong, woolly-tomentose, prickly petiole ½-2 in. long, ovate to almost orbicular, irregularly sinuate-lobed with the lobes blunt or acute, the larger ones 4-10 in., the smaller 2-4 in. long and broad, membranous, thick from a velvety or woolly tawny tomentum, on the midrib and on the nerves sparingly armed with long compressed prickles; flowers rather large, nearly an inch across, white or very pale blue, on ⅓-½ in. long, thick, hirsute and occasionally prickly pedicels, forming a short contracted umbel-like raceme or a few-flowered cluster in the axils of the leaves; calyx densely hirsute, occasionally with a few prickles, the lobes ovate, acute, about 3 lin. long; corolla hirsute outside, the lobes linear-lanceolate, acute; berries globular, supported by the hirsute 5-lobed calyx, about an inch or somewhat more in diameter, yellow when ripe, yellowish hirsute; seeds compressed, triangular-reniform with rounded angles, indistinctly scrobiculate.

Var. 2, **Trongum** (*S. trongum,* Poir.): more thickly stellate-tomentose, the flowers more frequently solitary; berries somewhat larger, losing their hairiness almost wholly and turning glossy and minutely and sparingly pubescent.

HAB.—Var. 1: not unfrequent in tropical forests along choungs and in moister hill poonzohs, from the Pegu Yomah and Martaban down to Tenasserim; usually also cultivated by the Karens; var. 2: still more frequently cultivated and often seen in deserted toungyas and rubbishy places; also on the Andamans, here introduced.—Fl. Fr. C.S.—SS.=∞.

REMARKS.—Wood white, very soft.

5. **S. Indicum,** NE.—A much branched shrub, 4-8 ft. high, all softer parts thickly covered with a short stellate tomentum and armed with broad, compressed, sharp and somewhat recurved glossy prickles; leaves more or less ovate, sinuate-lobed, with the entire lobes acute or blunt, obliquely truncate at the base, on a ½-1 in. long, sparingly but strong-prickly stellate-pubescent petiole, 1½-3 in. long, bluntish to bluntish acuminate or acute, membranous, above thickly covered with a minute stellate tomentum, beneath greyish stellate-tomentose; flowers rather small, blue or pale-blue, on 3-4 lin. long occasionally prickly pedicels, forming a lateral or spuriously terminal rather short stellate-pubescent raceme; calyx nearly 3 lin. long, greyish stellate-pubescent, with or without a few prickles, 5-lobed, the lobes lanceolate, acute; corolla rotate,

about ½ an in. in diameter, stellate-pubescent outside, the lobes nearly 4 lin. long, recurved; berries globular, the size of a large pea, supported by the 5-lobed sparingly prickly calyx, smooth and glossy, yellow or orange-yellow; seeds compressed, irregularly oval-reniform, minutely and indistinctly scrobiculate.

Hab.—Common in rubbishy places, deserted toungyas, savannahs, along river banks, etc., all over Burma from Chittagong and Ava down to Tenasserim.—Fl. Fr. ∞.—1.—SS. = ∞.

6. **S. spirale,** Roxb.—An evergreen branched shrub, unarmed, all parts glabrous; leaves more or less lanceolate to elliptically lanceolate, at the cuneate base decurrent in a shorter or longer (up to an in. long) petiole, 2-4 in. long, shortly acuminate, entire, membranous, glabrous; flowers rather small, white, on slender ½-1 in. long pedicels, forming a leaf-opposed, short-peduncled, slender, lax, glabrous raceme 1-2 in. long; corolla deeply 5-cleft, the lobes oblong, spreading, about 3 lin. long; calyx shallowly cup-shaped, about 2½ lin. wide, truncate, smooth; berries globular, supported by the explanate shallowly-lobed membranous calyx, the size of a large pea or small cherry, smooth and glossy, yellow; seeds obliquely ovoid-reniform, compressed, smooth.

Hab.—Ava.—Fr. Feb.

GARDNERIA, Wall.

Calyx 4-5-parted or -lobed, the lobes very blunt. Corolla almost rotate, deeply 4-5-cleft, the lobes thick, valvate in bud. Stamens 4 or 5, inserted at the corolla-throat; anthers almost sessile, conniving or almost connate. Ovary 2-celled, with solitary ovules attached laterally to the septum; style filiform, with a 2-lobed stigma. Berry globose, fleshy, 2-celled and usually 2-seeded. Seeds concave-orbicular, peltately attached with a hollow large base. Albumen fleshy; embryo small, straight, the radicle inferior.—Scandent shrubs, with simple opposite leaves. Flowers small, in axillary trichotomous panicles or cymes.

1. **G. ovata,** Wall.—A scandent evergreen shrub, all parts quite glabrous; leaves lanceolate to ovate- and oblong-lanceolate, acute at the base, on a slender petiole up to ½ in. long, acuminate, 2½-3½ in. long, entire, coriaceous, glabrous; flowers rather small, white or greenish white, on filiform ½ in. long pedicels minutely 2-bracteolate at the middle, usually by threes on a filiform or slender glabrous peduncle arising from the axils of the leaves; calyx minute, the 4 lobes rounded; corolla-lobes very thick, 4 in number, about 1½ lin. long, ovate, acute; anthers erect-connivent; berries globular, fleshy, the size of a pea, smooth, 2-seeded; seeds grey, smooth.

Hab.—Ava, hills towards Assam.—Fl. May.

BIGNONIACEÆ.

Flowers hermaphrodite, irregular. Calyx tubular to bell-shaped, truncate-toothed or laterally split. Corolla elongate or rarely short and bell-shaped, 5-lobed, the lobes spreading, often arranged in 2 lips, variously imbricate or rather induplicate-valvate in bud. Fertile stamens 2 or 4, or rarely also the 5 rudimentary one developed, in pairs, inserted in the tube; anthers 2-celled, the cells divaricate or rarely parallel, dehiscing longitudinally. Ovary usually 2-celled, with 2 distinct placentas in each cell attached to the dissepiments, and either contiguous or separated by a considerable interval, or the dissepiment discontinued between the placentas and the ovary appearing 1-celled; ovules several or numerous to each placenta; style filiform, with 2 short stigmatic lobes. Fruit a capsule, often very elongated, opening loculicidally or septifragally in 2 valves, leaving the dissepiment free. Seeds transverse, usually flattened, winged or wingless. Albumen none. Embryo straight or rarely curved, with flat or fleshy cotyledons, the radicle next the hilum.—Trees or shrubs, often climbing, very rarely herbs, with opposite or rarely scattered, compound or rarely simple leaves, the leaflets usually opposite. Stipules none. Flowers often showy, solitary and axillary, or more usually in racemes or panicles.

Besides some medicinal properties possessed chiefly by American species, little is known of other uses of the members of this family, which chiefly recommend themselves on account of their large and often gay-coloured flowers. However, the timber of many is valuable, and some of the hardest woods of Brazil come from bignoniaceous trees.

* *Seeds in a single row along the edges of the septum.*
○ Septum continuous, flat.
Calyx more or less distinctly 5-ribbed and 5-toothed, marcescent-persistent. Leaves unpaired pinnate with serrate-cut leaflets . *Stenolobium.*
○ ○ Septum more or less corky-medullary, jointed.
Calyx not ribbed, marcescent-persistent; seeds spuriously 2-celled; leaves pinnate . . . . . *Stereospermum.*
* * *Seeds in 2 or more imbricated rows along the edges of the continuous septum.*
○ Calyx more or less circumsciss-deciduous.
× Leaves ternately bipinnate or decompound.
Calyx urceolate, obsoletely 5-toothed; filaments inserted at the constriction of the tube; anther-cells divaricate . . . . *Radermachera.*
Calyx spathaceous, slit to about its middle; filaments adnate up to the middle of the corolla; anther-cells almost parallel . . *Mayodendron.*
× × Leaves unpaired-pinnate.
Calyx spathaceous, slit to the base; filaments inserted at the constriction of the tube; anther-cells divaricate . . . . *Spathodea.*
○ ○ Calyx persistent or marcescent-persistent.
× Leaves unpaired-pinnate.
Calyx 2-3-lobed, without ribs; capsule rather flat, not winged . *Heterophragma.*
Calyx 5-winged, 5-toothed; capsule flat, winged . . . . *Payanelia.*

× × Leaves ternately 2-pinnate or decompound; capsules flat.

Calyx truncate; corolla campanulate-funnel-shaped; fertile stamens 5 . . . . . *Oroxylum.*

Calyx obsoletely 5-toothed; corolla salver-shaped; fertile stamens 4, one of the anther-cells spurred . . . . . *Millingtonia.*

STENOLOBIUM, D. Don.

Calyx regular, 5-ribbed and 5-toothed. Corolla funnel-shaped, 5-lobed, the lobes almost regular, rotundate. Genitals included. Fertile stamens 4, didynamous, with a fifth rudimentary one; anthers discret. Stigma 2-lamellate. Capsule linear, compressed, pod-like, 2-valved, the septum contrary to the valves. Seeds winged, in a single row on each side of the septum.—Erect shrubs or small trees, with unpaired-pinnate or 1-foliolate leaves, the leaflets cut or serrate. Flowers in terminal racemes or panicles.

1. **St. stans,** Seem.—An evergreen erect shrub, growing out into a little tree up to 15 ft. high, all parts glabrous; leaves variable, from 1- to 3-foliolate to unpaired-pinnate; leaflets in 1 to 2 pairs, almost sessile, lanceolate, 1-3 in. long, acuminate, deeply serrate or cut, glabrous above, beneath along the nerves sparingly pubescent and glabrescent; flowers conspicuous, yellow, in simple racemes or panicles at the end of the branchlets; calyx bell-shaped, 5-nerved, the nerves hardly conspicuous and forming the acute teeth; corolla funnel-shaped, somewhat villous inside towards the base; filaments glandular-pubescent at the base; anthers villous; ovary and style glabrous; capsule 6 in. long by 3 lin. broad, glabrous.

Hab.—Of American origin, now frequently cultivated in gardens.

STEREOSPERMUM, Cham.

Calyx cupular-cylindrical to bell-shaped, minutely and bluntish 5-toothed to almost truncate, persistent and marcescent. Corolla bell- to funnel-shaped, abruptly constricted or gradually narrowed into a short tube, the limb almost 2-lipped with the upper lip reflexed or nearly regular. Fertile stamens 4, with a rudiment of a fifth one, inserted at the summit of the constricted part of the tube; anthers somewhat diverging. Disk fleshy, annular. Ovary 2-celled, with numerous ovules in a single row on each side of the placenta; stigma 2-lobed. Capsule elongate-linear, almost cylindrical or compressed-4-angular, the valves rigidly coriaceous, contrary to the spongy almost terete jointed septum. Seeds in a single row along the borders and immersed in the alternating cavities of the septum, spuriously 2-celled inside, elongate-winged.—Trees, with unpaired-pinnate leaves. Flowers in terminal panicles.

× *All parts, also the inflorescences, quite glabrous.*

Flowers yellow, rather small; septum of capsule terete . *S. chelonioides.*

Leaflets only about an inch long, serrulate; septum of capsule compressed . . . . . *S. serrulatum.*

×× *Younger parts and inflorescences variously pubescent.*

Flowers pale lilac or bluish white with dark-purple veins; inflorescence and calyx simply pubescent . . . . . *S. neuranthum.*

Flowers 2-lipped, uniformly lilac or purple, the lobes crenulate-undulate; inflorescence viscid-pubescent . . . . *S. suaveolens.*

Flowers funnel-shaped, uniformly pale lilac, the lobes long-fimbriate; inflorescence glandular-pubescent . . . . *S. fimbriatum.*

1. **St. chelonioides,** DC.; Bedd. Sylv. Madr., t. 72; Brand. For. Fl. 352.—*Tha-khwot-hpo.*—An evergreen (?) tree (40—60 + 15—30 + 4—5), all parts glabrous; leaves unpaired-pinnate, 1-1½ ft. long, with a striate rachis channelled above; leaflets in 4 to 5 pairs with a long-petioluled odd one, elliptically lanceolate to elliptical, acute at the somewhat oblique base, on a slender petiolule 3-5 lin. long, 2-3 in. long, long and slenderly acuminate, chartaceous, glabrous, entire, or while young sometimes serrate; flowers middling-sized, yellow, purplish brown on the outside of the tube, on 2-4 lin. long glabrous pedicels minutely 2-bracted towards the apex, forming an ample, lax, glabrous panicle at the end of the branchlets; calyx about 3 lin. long, smooth, shortly 3-lobed, the broader lobe more or less distinctly 2-toothed; corolla about an inch long, curved, 2-lipped, orange at the throat, the lobes crispate and wrinkled, the tube inside pilose; capsules elongate-linear, compressed 4-angular, ½-1 ft. long, glabrous; seeds thick, with diverging, concave, membranous pellucid wings.

Hab.—Rather frequent in the mixed, especially the lower mixed, forests from Chittagong and Ava down to Pegu.—Fl. begin. and close of R.S.; Fr. June-July and C.S.—l.—SS. = SiS. All.

Remarks.—Wood highly orange-yellow-coloured, close- and even-grained, elastic and durable, soft, takes good polish. Used in house-building.

2. **St. serrulatum,** DC.—A tree, all parts glabrous; leaves only up to ½ ft. long, unpaired-pinnate; leaflets in 2-4 pairs with a long-petioluled odd one, obovate to obliquely elliptical-lanceolate, on a very short petiolule, unequal at the base, about an inch long or somewhat longer, shortly and rather abruptly but sharply acuminate, obsoletely crenate-serrate towards the apex, chartaceous, glabrous; flowers unknown; capsule pod-like, compressed, 2 ft. long, glabrous; seeds in a single row along the edges of the thick, somewhat compressed, corky, slightly jointed placenta, spuriously 2-celled, flat.

Hab.—Ava.

3. **St. neuranthum,** Kz.—*Than-day.*—A tree (40—60 + 12—30 + 3—6), shedding leaves in H.S., the younger parts softly pubescent; bark ½ an in. thick, grey, rough; cut dry, pale-coloured; leaves unpaired-pinnate, 1-1½ ft. long, while young, especially beneath,

softly pubescent; leaflets in 3 or 2 pairs with a long-petioluled odd one, acute or obtuse at the somewhat unequal base, on a strong 1-2 lin. long petiolule, 2-4 sometimes 5-6 in. long, bluntish to bluntish apiculate, entire, rigidly chartaceous, while young greyish tomentose beneath, soon turning roughish and shortly puberulous like the somewhat wrinkled upper surface; flowers conspicuous, very pale lilac or bluish white, with dark-purple veins, on 4-7 lin. long pubescent pedicels 2 bracteoled towards the apex, forming a rather short, corymb-like, peduncled, pubescent panicle at the end of the branchlets; calyx about 4 lin. long, shortly 4-lobed, pubescent; corolla campanulate-funnel-shaped, somewhat curved, puberulous, the lobes somewhat waved-crispate; capsules elongate-linear, curved, cylindrically 4-gonous, 1-1½ ft. long, glabrous; seeds and septum as in *St. chelonioides*.

Hab.—Common in the lower and upper mixed forests of the Pegu Yomah.—Fl. Apr.; Fr. C.S.—l.—SS.=*SiS.* All.

Remarks.—Wood pale-greyish or reddish brown, very close-grained, fibrous, rather heavy, tolerably soft.— □′=33-36 pd.

4. **St. suaveolens,** DC.; Bedd. Sylv. Madr. 149; Brand. For. Fl. 351.—A tree (30—40+6—12+3—5), shedding leaves in H.S., the younger parts covered with a viscid pubescence; leaves unpaired-pinnate, 1-1¼ ft. long; leaflets in 3-4 pairs with a long-petioluled odd one, ovate to elliptically ovate, on a short, thick, shortly pubescent petiolule, rounded or obtuse at the base, 2-4 in. long, shortly and bluntish acuminate, entire, rigidly chartaceous, while young membranous and pubescent, adult scabrous above and very shortly puberulous beneath; flowers middling-sized, pale or dark lilac, glandular-puberulous, on slender up to an inch long pedicels minutely 2-bracteoled towards the apex, forming a glandular-pubescent lax panicle at the end of the branchlets; calyx about 4 lin. long, glandular-pubescent, purplish green, shortly 3-lobed; corolla funnel-shaped, slightly curved, about 1¼ in. long, glandular-puberulous, 2-lipped, the lobes crenulate-waved; capsule elongate-linear, 1-1½ ft. long, cylindrical, with 4 prominent lines, glabrous and tubercled-rough; seeds as in preceding.

Hab.—Not unfrequent in the Eng forests of Martaban.—Fl. Apr.—l.—SS.=Metam. Lat.

Remarks.—Wood dark-coloured, strong.

5. **St. fimbriatum,** DC.—*Than-that.*—A tree (70—80+30—50+6—8), shedding leaves during H.S., the younger parts all viscid-pubescent; bark grey, about an inch thick, lamellate-rough, shortly longitudinally fissured; cut pale-coloured; leaves unpaired-pinnate, while young very like those of the preceding species and similarly viscid-pubescent; leaflets of young leaves (old ones not

seen) ovate-lanceolate, on a 1-2 lin. long petiolule, 2-3 in. long, long and sharply acuminate, entire, membranous, viscid-pubescent; flowers conspicuous, very pale lilac, on 3-5 lin. long pedicels, forming an ample viscid-pubescent panicle at the end of the branchlets; calyx 3-4 lin. long, 3- or 4-lobed, viscid-pubescent; corolla funnel-shaped, straight or nearly so, gradually tapering into the slender tube, sparingly glandular-pubescent, the lobes almost equal, long-fimbriate.

Hab.—In the tropical forests of Martaban and Upper Tenasserim, up to 3,000 ft. elevation.—Fl. March.—s : l.—SS.=Metam.

RADERMACHERA, Zoll.

Calyx urceolate, almost entire or shortly lobed, coriaceous, tardily circumsciss-deciduous. Corolla funnel-shaped, constricted at the base, the limb spreading, 5-lobed, the lobes more or less 2-lipped, rotundate. Fertile stamens 4, didynamous, with a fifth sterile one, included; anthers 2-celled, the cells divaricate. Disk fleshy, entire. Ovary cylindrical, the stigma 2-lobed. Capsules slender, rather terete and somewhat twisted, the septum compressed, somewhat spongy, continuous, contrary to the valves and bearing on each side a double row of compressed winged seeds. Testa dark-coloured, glossy.—Trees, with 2-3-pinnate or decompound leaves. Flowers showy, in terminal racemes or panicles.

1. **R. amœna,** Seem. (*Spathodea amœna,* DC.; Brand. For. Fl. 349).—A small tree, all parts quite glabrous; leaves tripinnate, on an almost terete petiole 3-4 in. long; leaflets broadly lanceolate to lanceolate, acuminate at both ends and tapering in a 2-5 lin. long channeled petiolule, 1-2 in. long, entire, firmly membranous, glabrous; flowers conspicuous, white, with a pale-rose-coloured tube, on 3-5 lin. long slender pedicels, forming an ample, glabrous, brachiate panicle at the end of the branchlets; calyx campanulate-spathaceous, nearly ½ in. long, smooth, unequally 2-3-cleft, the one lobe usually much rounded; corolla more than an inch long, campanulate-funnel-shaped, streaked yellowish brown inside at the bottom, glabrous; filaments pubescent at the base, inserted at the upper part of the constricted corolla-tube; capsules thin, cylindrical or nearly so, 1-1½ ft. long, smooth, with a raised line along the middle of the valves; septum somewhat compressed, spongy-corky, bearing along each border a single row of long-winged seeds.

Hab.—Ava.

MAYODENDRON, Kz.

Calyx half-spathaceous, slit to about the middle, circumsciss-deciduous. Corolla tubular-funnel-shaped, the tube shorter than the limb, the lobes very short, almost equal. Fertile stamens 4,

almost equally long, adnate to the corolla up to its middle, the fifth minute and rudimentary; anther-cells almost parallel. Disk annular. Ovary 2-celled, with 2 rows of numerous ovules on each side of the placentas; stigma 2-lobed. Capsule pod-like, linear-cylindrical and slender, the valves thin-coriaceous, smooth, longitudinally nerved; septum narrow, contrary to the valves, with a broad prominent edge on both sides along the middle. Seeds in several series along the border of the septum, elongate-winged on both ends.—Trees, with ternately decompound leaves. Flowers conspicuous, in short racemes, terminal or from short shoots.

1. **M. igneum,** Kz.—A tree (30—40 + 10—18 + 4—6), probably evergreen, the very young shoots minutely puberulous; bark ½ an in. thick, grey, longitudinally wrinkled; cut pale-coloured; leaves ample, ternately decompound, resembling those of *Acrocarpus*, the lower pinnæ 2-pinnate, the upper ones gradually simply pinnate, glabrous; leaflets obliquely oblong-lanceolate to falcately ovate-lanceolate, very shortly petioluled, 3-4 in. long, bluntish acuminate, entire, chartaceous, glabrous and glossy; flowers showy, orange-crimson, on ½-¾ in. long puberulous pedicels, forming a short cluster or corymb-like puberulous raceme at the end of the branchlets or of young shoots arising from above the scars of fallen leaves; calyx spathaceous, 6-7 lin. long, shortly puberulous, green or purplish green; corolla glabrous, inside at the tube puberulous, 2 in. long or somewhat longer, the lobes rotundate, only ¼-⅓ in. long; pods thin and slender, cylindrical, about 1½ in. long, glabrous; seeds (including the elongate pellucid wings) narrow-linear, about ⅓ in. long.

Hab.—Not unfrequent in the tropical forests of Martaban, up to 3,000 ft. elevation; also Ava hills.—Fl. March-Apr.—Fr. Apr.-May.—s.—SS.=Metam.

Remarks.—Wood white, turning pale-greyish brown, soft, fibrous but close-grained.

SPATHODEA, PB.

Calyx spathaceous, slit to the base, circumsciss-deciduous, entire. Corolla tubular to almost campanulate-funnel-shaped, gradually or abruptly constricted in a shorter or longer tube, the limb almost equally 5-lobed, imbricate in bud. Fertile stamens 4, didynamous, with a fifth rudimentary one inserted at the corolla-throat; anther-cells diverging. Ovary 2-celled, the cells with numerous ovules arranged in 2 or 3 rows on each side of the placenta. Disk entire. Capsule pod-like, cylindrical or compressed, dehiscing loculicidally, leaving the contrarily placed septum free. Seeds corky- or membranously -winged, placed in 2 or 3 rows at each side of the more or less flattened continuous septum.—Trees, with unpaired-pinnate (rarely simple) leaves. Flowers usually showy, in terminal racemes or panicles.

* *Corolla white, tubular-funnel-shaped, gradually narrowed in the long tube. Seeds corky-winged.*

All parts, also the calyx, glabrous . . . . . *S. Rheedei.*

* * *Corolla yellow or brownish-yellow, campanulate-funnel-shaped, abruptly constricted in a rather short tube. Seeds membranously winged.*

Leaves entire; calyx and inflorescence generally tawny-villous . *S. stipulata.*

Leaves serrulate; calyx tawny velvety . . . . . *S. velutina.*

1. **Sp. Rheedei,** Wall.; Bedd. Sylv. Madr. 148.—*Thakhootma.*—A leaf-shedding tree (40—50+12—30+4—7), all parts glabrous; leaves unpaired-pinnate, up to a foot long, glabrous, the petiole angular-furrowed on the upper side; leaflets in 3-4 pairs, with a long-petioluled odd one, acute at the base, elliptically ovate to ovate-lanceolate, on a short 1-2 lin. long petiolule, 1½-3 in. long, long-acuminate, entire or somewhat waved, almost chartaceous; flowers appearing with the young leaves, very large, white, on 1-1½ in. long glabrous pedicels, very rarely solitary, but usually forming a very short corymb-like poor raceme at the end of the young branchlets; calyx nearly an inch long, smooth, green; corolla tubular-funnel-shaped, 3½-4½ in. long, smooth, the lobes short, waved-crispate; capsules 1-2 ft. long, almost cylindrical, glabrous, the valves somewhat prominently but obtusely angular; seeds corky-winged.

Hab.—Not unfrequent in the lower and upper mixed forests, from Prome and the Pegu Yomah down to Tenasserim; also on the Andamans.—Fl. March-Apr.; Fr. June-July.—l.—SS.=SiS. All Metam.

2. **Sp. stipulata,** Wall.—*Malwa.*—A tree (30—40+20—25+4—6), shedding leaves in H.S., the younger branchlets villous-pubescent; bark about ½ an in. thick, resembling that of teak, grey, longitudinally and narrowly fissured; cut red-brown, dryish; leaves unpaired-pinnate, 1-1½ ft. long, with a glabrous or slightly puberulous channeled-striate rachis, usually furnished with a few diminutive leaflets towards the base of the petiole so as to appear stipuled; leaflets in 3 or 4 pairs with a long-petioled odd one, on a pubescent very short petiolule, elliptically oblong to elliptically ovate, 3-7 in. long, acute or obtuse at the base, shortly acuminate to apiculate, entire or nearly so, chartaceous, beneath more or less covered with a secernible, thin, floccose tomentum; flowers large, yellow, somewhat reddish outside (especially the tube), on very thick, villous, 4-5 lin. long pedicels, forming a short, straight, robust, tawny-villous raceme at the end of the branches; calyx spathaceous, about 1-1¼ in. long, tawny villous; corolla campanulate-funnel-shaped and somewhat inflated above the constricted short tube, 2-2½ in. long, quite glabrous; filaments purple, inserted above the constriction of the corolla; capsules somewhat compressed, narrow-lanceolate, especially while young densely villous,

1-1¼ ft. long, the valves flat; seeds elongate-winged, nearly 2 in. broad.

Hab.—Rather rare in the open and the drier upper mixed forests of the Pegu Yomah and Martaban, as far down as Rangoon; also Ava.—Fl. Jan.-March; Fr. May-June.—l.—SS.=Metam. SiS (?) Lat.

Remarks.—Wood pale brown, heavy, fibrous, close-grained. Used for bows and spear-handles, also for paddles and oars.

3. **Sp. velutina,** Kz.—A tree apparently of the appearance of the preceding species, the young shoots shortly tawny-pubescent; leaves unpaired-pinnate, 1-1½ ft. long, the petiole glabrous, striate, with 1 or 2 diminutive stipule-like deciduous leaflets towards the base; leaflets in 4 pairs with a long-petioled odd one, sessile or nearly so, unequal at the base, oblong-lanceolate, 4-6 in. long, acuminate, serrulate, membranous, quite glabrous; inflorescence unknown; calyx spathaceous with a recurved point, about 1½ in. long, tawny velvety outside; corolla about 3 in. long, campanulate-funnel-shaped, glabrous, constricted into a tube an inch long; filaments inserted above the constriction, glabrous.

Hab.—Ava; Pegu.—Fl.-Sept.

HETEROPHRAGMA, DC.

Calyx bell-shaped, 3-lobed, marcescent-persistent. Corolla bell-shaped or campanulate-funnel-shaped, with a rather short and ample tube, the lobes unequal or nearly so. Fertile stamens 4, didynamous, with a fifth rudimentary one; anther-cells divaricate. Disk entire, annular. Ovary 2-celled, the cells with numerous ovules in several rows along each side of the dissepiment; style filiform, the stigma 2-cleft. Capsule oblong to linear, the valves contrary to the broad, flat, continuous septum, more or less raised along its middle in a longitudinal prominent rib or ledge, and the capsule, therefore, sometimes appearing 4-celled. Seeds in several rows, amply winged.—Trees, with unpaired-pinnate leaves. Flowers conspicuous, in terminal racemes or panicles.

Corolla funnel-shaped, yellow; pods rather flat, without ribs, villous-tomentose . . . . . *H. sulfurea.*
Corolla campanulate-funnel-shaped, dull-brown; pods rather cylindrical, ribbed, scurfy-tomentose . . . . . *H. adenophylla.*

1. **H. sulfurea,** Kz.—*Thit-leng-da.*—A tree (25—40 + 10—25 + 3—5), leafless in H.S., the young parts covered with a fugacious greyish villous tomentum; leaves unpaired-pinnate, 2-3 ft. long, the rachis and petiole fugaciously floccose-tomentose; leaflets in 4 to 5 pairs, with a long-petioluled odd one, from elliptical and elliptically ovate to oval, rounded or obtuse at the base, sessile or very shortly petioluled, 4-6 in. long or longer, while young bluntish-

apiculate or bluntish and obscurely serrate, chartaceous, slightly and shortly pubescent, glabrescent above; flowers showy, sulphur-coloured, on greyish or yellowish grey, tomentose, 3-4 lin. long pedicels, forming short densely tomentose panicles at the end of the leafless branches; calyx $\frac{1}{2}$-$\frac{3}{4}$ in. long or shorter, bell-shaped and slit to the middle, distinctly 3- or 2-toothed or -lobed, greyish tomentose outside, glabrous inside; corolla funnel-shaped, quite glabrous, the tube an inch long or longer, the lobes spreading and more than $\frac{1}{2}$ the length of the tube, undulate-crispate; capsules up to 2 ft. long, exactly as those of *Spathodea stipulata*, elongate linear-oblong, rather compressed, acuminate, densely greyish-tawny tomentose, the septum very reduced and short, the median edges septum-like dilated; seeds elongate-winged, about 2 in. long.

Hab.—Not unfrequent in the open and dry forests of Prome, less frequent along the base of the Pegu Yomah.—Fl. March-Apr.; Fr. June (?)—l.—SS.= Dil. *CaS.*

2. **H. adenophylla,** Seem.—*Hpet-than.*—A leaf-shedding tree (30—50+10—25+3—6), the younger parts covered with a short, brown, scurfy, secernible tomentum; leaves unpaired-pinnate, 1-1$\frac{1}{2}$ ft. long with a puberulous glabrescent rachis, the petiole often furnished above the base with a pair of diminutive auricle-like leaflets; leaflets in 2 or 3 pairs with a long-petioluled odd one, elliptical to oval and obovate, almost sessile with a rounded or acute base, 3-7 in. long, while young acute or apiculate, entire, chartaceous, beneath softly but shortly pubescent; flowers large, dull-brown, on 3-4 lin. long tomentose pedicels, forming a rather short, tawny or brown tomentose panicle at the end of the branchlets; calyx nearly an inch. long, bell-shaped, irregularly 3-lobed, densely but shortly brown-scurfy-tomentose; corolla campanulate-funnel-shaped with an ample glabrous tube constricted at the summit, the limb nearly 1$\frac{1}{2}$ in. in diameter, fulvous-tomentose outside; capsules 2-2$\frac{1}{2}$ ft. long, rather cylindrical, longitudinally angular-ribbed, shortly scurfy-tomentose, especially while young; seeds glossy, yellowish, with very thin pellucid wings at their extremities.

Hab.—Not unfrequent in the upper mixed forests from Ava, Pegu, and Martaban down to Tenasserim and the Andamans.—Fl. close of C.S.; Fr. Apr.-May.—l.—SS.=*SiS.* Metam.

PAYANELIA, DC.

Calyx tubular-bell-shaped, shortly 5-lobed, between the lobes produced into keel-like folds, marcescent-persistent. Corolla ventricose-funnel-shaped and constricted into a short tube, the lobes somewhat unequal. Fertile stamens 4, with a fifth rudimentary one, didynamous, inserted at the constriction of the corolla-tube;

anther-cells divaricate. Disk annular. Ovary 2-celled; style long; stigma clavate, 2-lobed. Capsule obversely elongate-lanceolate, along the margins extended into broad wings, the septum contrary to the valves. Seeds amply winged all round, in several rows along the edges of the flat conspicuous septum.—Trees, with unpaired-pinnate leaves. Flowers large, in terminal robust panicles.

1. **P. multijuga,** DC.—*Kyoung-touk.*—An evergreen tree (60—80 + 20—50 + 4—7), all parts glabrous; bark about ¼ in. thick, dark-grey, rather rough and longitudinally fissured; cut dryish; leaves unpaired-pinnate, 1½-3 ft. long, glabrous, with an angular rachis; leaflets in 10-12 pairs with an odd one, ovate to ovate-lanceolate, rounded at the one and acute at the other side of the unequal base, 3-8 in. long, very shortly petioluled, shortly acuminate to acute, entire, almost coriaceous, glabrous; flowers large, dull-purplish with a yellow limb, on short thick pedicels, forming an ample, erect, robust, glabrous panicle at the end of the branches; calyx nearly an inch long; corolla 2-3 in. across the lobes, obovate, broad, crenulate and crispate, along their margins whitish stuppose-tomentose; capsules flat, obovate-lanceolate, 1-1½ ft. long by 2½-3 in. broad, broadly winged, glabrous.

Hab.—Common in the tropical and moister upper mixed forests, all over the Pegu Yomah and from Martaban down to Tenasserim and the Andamans.—Fl. Jan.; Fr. H.S.—s: l.—SS.=SiS.—Metam.

Remarks.—Sapwood yellowish white; heartwood brown, coarsely fibrous, somewhat heavy, rather close-grained.

OROXYLUM, Vent.

Calyx tubular-bell-shaped, truncate, bursting, persistent. Corolla campanulate-funnel-shaped, gradually tapering in a wide tube, the limb unequal and almost 2-lipped. Disk large, cup-shaped, 5-lobed. Fertile stamens 5, hardly exserted, didynamous, the fifth shorter; anthers somewhat spreading. Ovary 2-celled, the style long with a 2-lobed stigma. Capsule elongate-oblong, flat, the valves parallel with the septum. Seeds very compressed and amply hyaline-winged, in several rows along the edges of the broad, flat, continuous septum.—Trees, with ternately bipinnate leaves. Flowers large, in a terminal robust raceme.

1. **O. Indicum,** Bth. (*Calosanthes Indica,* Bl.; Brand. For. Fl. 347; *Bignonia Indica,* L.; Bedd. Sylv. Madr. 148).—*Kyoung-ya-pen.*—A leaf shedding tree (25—40 + 10—15 + 2—4), all parts glabrous or the younger parts minutely puberulous; bark about an inch thick, grey, rather smooth, but not even; cut yellow; leaves ternately bipinnate, ample, 2-3 ft. in diameter; leaflets ovate to elliptical and obovate-oblong, usually very unequal at the rounded or

obtuse base, 2-3 in. long, shortly and bluntish acuminate or apiculate, entire, chartaceous, glabrous above, beneath minutely puberulous or almost glabrous; flowers large and showy, purplish, with a yellow tube, on short and very thick pedicels, forming a stiff, erect, robust, glabrous raceme at the end of the thick branchlets; calyx about an inch long or shorter; corolla up to 3 in. long, glabrous; capsule concave-flat, elongate-oblong, 2-4 ft. long by 3-4 in. broad, glabrous, with a raised obscure rib along the middle; seeds about 1½ in. across, with a pellucid very ample wing all round, in several rows along the edges of the broad flat septum.

Hab.—Frequent in all leaf-shedding, especially the mixed, forests, all over Burma from Ava and Chittagong down to Tenasserim and the Andamans.—Fl. Nov.-Dec.; Fr. C.S.—l.—SS.=∞ *SiS.*

Remarks.—Wood yellowish white, light, coarse-grained, takes indifferent polish.—□′=23 pd.

MILLINGTONIA, L.

Calyx bell-shaped, obscurely 5-lobed, persistent. Corolla salver-shaped with a long slender tube, the limb short, almost unequal and 2-lipped, the 2 upper lobes connate to near their middle. Fertile stamens 4, without a sterile one, inserted at the summit of the tube and exserted; anther-cells parallel, the one cell spurred at the base. Disk annular. Ovary 2-celled; style very long and slender, exserted; stigma 2-lobed. Capsule pod-like, elongate, the valves parallel with the septa, the latter flat, continuous, bearing many rows of broadly winged seeds along the borders.—Trees, with tripinnate leaves. Flowers showy, in terminal ample panicles.

1. **M. hortensis,** L.f.; Bedd. Sylv. Madr., t. 249; Brand. For. Fl. 347.—*Ay-ka-yit.*—An evergreen tree (70—80 + 20—40 + 6—12), all parts glabrous; bark about an inch thick, dark grey, corky-fissured; cut dryish, pale-coloured; leaves ternately 3-pinnate, 2-3 ft. long; leaflets ovate to broadly lanceolate, those of the lower pinnæ and pinnules long-petioluled, the upper ones sessile or nearly so, rounded or obtuse at the base, 1-2 in. long, bluntish acuminate, entire, membranous, glabrous or minutely puberulous beneath; flowers showy, white, fragrant, on short puberulous pedicels, forming an ample puberulous or glabrous panicle at the end of the branchlets; calyx about 1 or 2 lin. long, almost truncate; corolla varying in length from 1½-2½ in., glabrous, the lobes velvety-pubescent inside; capsules elongate-linear, about 1½ ft. long, compressed, glabrous; seeds nearly an inch across, flat and thin, surrounded by a pellucid tender wing, arranged in several rows along the edges of the flat broad septum.

HAB.—Rather rare in the tropical forests from Martaban down to Tenasserim; also Ava.—SS.=Metam.

REMARKS.—Wood white or pale yellow, rather heavy-coarse, fibrous, but rather close-grained; takes fine polish. Bark used as an inferior substitute for cork.

ACANTHACEÆ.

Flowers hermaphrodite, irregular. Calyx toothed or more or less deeply divided into 5 lobes, or the sepals free, regular or more usually irregular. Corolla with a long or short tube, the limb 2-lipped or expanded, twisted or otherwise imbricate in bud. Stamens inserted in the tube, 4 in number and didynamous, or 2 only, the others reduced to staminodes or entirely wanting; anthers 2- or 1-celled, the cells parallel, oblique or superposed, opening longitudinally. Ovary superior, 2-celled, the cells with 2 or more ovules; style simple, usually subulate, with an entire or 2-lobed stigma. Capsule opening loculicidally in 2 valves, usually elastically recurved and bearing the placentas along their centre. Seeds usually flat, attached to hooked processes (retinacles) arising from the dissepiment, or rarely the seeds globular and resting on cup-shaped dilatations or mere papillæ sometimes almost inconspicuous. Albumen none. Embryo usually curved.—Herbs, shrubs or rarely trees, with opposite simple leaves. Flowers axillary or terminal, in spikes, racemes, panicles or clusters. Bracts conspicuous or minute; bractlets rarely wanting and sometimes large and leafy.

Upwards of 140 species of *Acanthaceæ* are found in Burma, but only very few of them are woody, and none possess properties that would render them important. However, *Strobilanthes flaccidus* is cultivated by the Karens for its blue dye.

* *Calyx reduced to a ring, with or without any teeth; seeds globular, resting on a cup-shaped expansion of the placenta; capsules beaked* . . . . . *Thunbergia.*

* * *Calyx fully developed, regular or irregular; seeds compressed and supported by hooked retinacles.*

○ Anthers 1-celled; corolla slit to the base and expanded into a single lip . . . . . *Acanthus.*

○ ○ Anthers 2-celled.

\+ Anther-cells parallel or nearly so.

× Capsules more or less angular, often tapering in a sterile base. Calyx-segments more or less unequal . . . . . *Strobilanthes.*

× × Capsules terete, seed-bearing from the base; calyx regular . . . . *Phlogacanthus.*

\+ \+ Anther-cells superposed . . . . . *Justicia.*

THUNBERGIA, L.f.

Calyx reduced to an entire or many-toothed ring and concealed

within 2 large bractlets. Corolla campanulate-funnel-shaped with the throat inflated, the 5 lobes nearly equal, twisted in bud. Stamens 4, didynamous; anthers adnate, erect, the cells parallel with ciliate-bearded margins. Ovary 2-celled, the cells 2-ovuled; stigma infundibuliform-2-lobed. Disk thick, lobed, surrounding the ovary. Capsule globular, long-beaked, at the base 2-4-seeded. Seeds globular.—Scandent, shrubs or twiners. Flowers conspicuous, axillary and solitary, or in terminal racemes.

∗ *Calyx-limb truncate; corolla bell-shaped.*	
Leaves broadly ovate, angular-lobed, more or less hairy	*T. grandiflora.*
Leaves ovate-oblong, obsoletely or repand-toothed, glabrous, not peltate	*T. laurifolia.*
Leaves ovate-oblong, remotely toothed, glabrous, peltate at base	*T. smilacifolia.*
∗ ∗ *Calyx many-toothed; corolla funnel-shaped.*	
Petioles terete	*T. fragrans.*
Petioles more or less winged	*T. alata.*

1. **T. grandiflora,** Roxb.—An evergreen large climber with terete scabrously hairy stems, all softer parts more or less pubescent or hispid; leaves broadly cordate or ovate-cordate, on a pubescent petiole 2-3 in. long, acuminate or acute, 4-5 in. long and as broad or narrower, membranous, scabrously pubescent on both surfaces, or hispid or hispid-tomentose beneath; flowers large, about 3 in. in diameter, pale blue with a white throat, rarely quite white, on longer or shorter pedicels, solitary in the axils of the leaves and forming longer or shorter shortly pubescent racemes at the end of the branches; bractlets large, nearly falcate-oblong, scabrously tomentose; calyx truncate; corolla-lobes obovate; capsules about 1½ in. long, with a long flat woody beak, glabrous; seeds globular, echinate-tubercled.

Hab.—Chittagong.—Fl. & Fr. ∞.

2. **T. laurifolia,** Ldl.—*Nway-cho.*—An evergreen lofty woody climber up to 100-150 ft. long, all parts glabrous; stems cylindrical, elastic, grey, as thick as the arm, the branchlets somewhat 4-cornered and marked by 4 decurrent lines; bark about a line thick, smooth; cut green; leaves ovate-oblong or oblong, on a glabrous petiole 1-1½ in. long, acuminate, 4-6 in. long, repand-toothed or almost entire, rotundate or obtuse at the 3-7-nerved base, chartaceous, glabrous and more or less glossy; flowers large, pale-blue, about 2-2½ in. in diameter, on shorter or longer tomentose or glabrous pedicels, forming tomentose or glabrescent shorter or longer lateral racemes; bractlets velvety-tomentose or glabrous, blunt or acute; calyx-limb entire, puberulous; corolla-lobes rotundate, slightly emarginate; capsules glabrous, globose, with a compressed woody beak.

Hab.—Common in the tropical and mixed forests all over Burma and the adjacent islands down to Tenasserim and the Andamans.—Fl. C.S.

Remarks.—Wood greyish brown, very porose, rather light, soft.

3. **T. smilacifolia,** Kz.—An evergreen glabrous climber with sulcate branches; leaves ovate-lanceolate, peltate at the truncate or slightly emarginate base, acuminate, 3-4 in. long, on a slender glabrous petiole 2-3 in. long, remotely and slightly callose-toothed, membranous, opaque on both surfaces, palmately 5-nerved, with the veins between indistinct; flowers large, blue (?), on longer or shorter velvety-tomentose pedicels, forming 1-1½ ft. long velvety-tomentose racemes; bractlets falcate-lanceolate, acuminate, velvety-tomentose; corolla-lobes rotundate, entire; calyx-limb truncate, tomentose.

Hab.—Ava.—Fl. Feb.

ACANTHUS, L.

Calyx 4-parted, the upper entire segment somewhat larger, the lower 2-cleft. Corolla-limb expanded into a large, entire or 3-lobed lip, the upper lip wanting or scarcely prominent. Stamens 4, didynamous; anthers 1-celled, adnate, bearded and fringed. Ovary 2-celled, the cells 2-ovuled. Capsule compressed, 4-seeded. Seeds large, flat, supported by thick seed-bearers.—Erect or twining shrubs or herbs, the leaves often spiny. Flowers usually conspicuous, in bracted terminal spikes.

* *Shorter filaments at the apex hook-like inflexed. Bracts, etc., spiny-toothed.—Herbs.*

Corolla 1⅓ in. long, almost glabrous; bracts pubescent, rotundate, bristly mucronate; leaves long-petioled . . . . . *A. longipetiolatus.*

* * *Filaments all straight. Bracts entire.*

× Erect shrubs.

Leaves sessile or very shortly petioled, prickly-lobed; flowers 1½-2 in. long . . . . . *A. ilicifolius.*

Petioles ½ an in. long, rarely very short; leaves entire or toothed; flowers an inch long or a little longer . . . . . *A. ebracteatus.*

× × Twining shrubs; leaves obovate, entire . . . *A. volubilis.*

1. **A. ilicifolius,** L.—*Kha-ya.*—An evergreen erect shrub, glabrous, 2-4 ft. high; leaves elliptical to elongate-oblong, very shortly petioled or almost sessile, 4-8 in. long, acute or acuminate, harshly coriaceous and glossy, glabrous, shortly lobed or toothed and waved, the teeth or lobes terminating into sharp prickles; stipules at the base of the petiole consisting of short, straight prickles; spikes terminal or in the axils of the upper leaves, ½-1 ft. long; bracts ovate, acute or blunt, about half as long as the calyx or shorter, coriaceous, glabrous, striate; bractlets conform, but smaller, often mucronate; calyx-segments oblong, coriaceous, the 2 outer ones 6-8 lin. long, the 2 inner ones smaller, similar to the bracts;

corolla sky-blue or white, the upper lip very short, truncate and coriaceous, the lower expanded into an obovate shortly 3-lobed limb of 1½ in. length, the middle lobe minute or almost wanting; anthers 3-4 lin. long, very densely hirsute-fringed; capsule nearly an inch long and half as broad, very shining, blunt; seeds large.

Hab.—Common all along the coasts of Burma and adjacent islands down to the Andamans, specially in tidal jungles of the estuaries.—Fl. Fr. all the year. —l.—SS.=All. Sal.

2. **A. ebracteatus,** Vhl.—An evergreen glabrous shrub, about 3-4 ft. high; leaves elliptically to oblong-lanceolate, tapering into a ½-¾ in. long (very rarely short) petiole, bristly acute, entire or spiny-toothed, thinly coriaceous and flaccid or harshly coriaceous, 6-7 in. long; stipular spines short and straight or wanting; spikes terminal and in the axils of the upper leaves, 2-3 in. long; bracts and bractlets conform, sometimes very deciduous, about ⅓ the length of the calyx, ovate, blunt or mucronate, rarely shortly acuminate; calyx-segments oval, about ½ in. long, blunt, scarious along the borders, appressed silky-pubescent within, the inner ones shorter; corolla white, 1-1½ in. long; lower lip broadly obovate-oblong, shortly 3-lobed, the middle lobe very small; anthers about 3 lin. long, very densely hirsute-fringed.

Hab.—Not unfrequent in the mangrove jungles of the Andamans; also Tenasserim.—Fl. March-Apr.—SS.=All. Sal.

3. **A. volubilis,** Wall.—An evergreen twining shrub, 10-15 ft. long, unarmed and glabrous; branches terete, with 4 elevated lines; leaves obovate-oblong or oblong, cuneate at the base, tapering in a ½-¾ in. long petiole, blunt and mucronulate, quite entire, fleshy-coriaceous, glabrous and glossy; stipular prickles none; spikes 4-6 in. long, terminal; bracts oblong-lanceolate, acute, deciduous; outer sepals conform to the bracts, acuminate, ½ an in. long or somewhat longer, inner ones shorter, yellow; corolla white, about an inch long, the lower lip obovate-oblong, shortly 3-lobed, velvety inside; anthers about 2 lin. long, densely hirsute-fringed; capsules 1 in. long, ovate-oblong, blunt and mucronate, glossy.

Hab.—Not unfrequent in the tidal jungles along estuaries of the rivers from Arracan down to Pegu.—Fl. Fr. Apr.-June.—s.—SS.=*Sal.* All.

STROBILANTHES, Bl.

Calyx 5-parted to near the base, the segments equal or unequal, rarely the calyx 2-lipped, with the lips 2- or 3-toothed. Corolla funnel-shaped-campanulate, the lobes equal or nearly so. Stamens 4, didynamous, or 2, with or without 1-3 rudimentary ones; anther-cells parallel. Capsule club-shaped, 4- or 6-cornered,

from the middle or lower down 2-8-seeded, tapering in a sterile solid base. Seeds discoid, on hooked seed-bearers.—Shrubs or herbs, with entire or serrate leaves. Flowers often conspicuous, in spikes, heads or panicles, rarely solitary or clustered in the leaf-axils. Bracts leafy, persistent or deciduous; bractlets small or sometimes wanting.

* *Capsules* 6-15-*seeded. Corolla yellow.*

Leaves harsh, glabrous, shortly petioled; flowers yellow, in dense spikes; bracts green; capsules 6-8-seeded . . . . *S. flava.*

** *Capsules* 2-4-*seeded. Corolla purple or blue.*

× Spikes head-like, on longer or shorter peduncles, occasionally sessile; bracts conspicuous, irregularly imbricate. No leafy involucre.

All parts glandular-puberulous; flower-heads often by 2 or 3, axillary, on longer or shorter peduncles . . . . *S. Simonsii.*

×× Flower-heads dense, at or near the base surrounded by floral leaves which form a conspicuous involucre.

Stems shortly glandular-hairy; leaves glabrous above; flower-buds yellowish villous; bracts leafy . . . . . *S. lamioides.*

××× Spikes lax, often interrupted; bracts linear, acuminate.

Spikes glabrous; bracts long, lanceolate, minutely appressed-bristly (not glandular); filaments villous . . . . *S. fimbriata.*

Spikes and the long lanceolate bracts glandular-pubescent; filaments glabrous . . . . . *S. Neesii.*

1. **S. flava,** Kz.—*Myet-nha-pan.*—An evergreen very bushy shrub, sometimes up to 12 ft. high, and making a short trunk of 1 to 2 ft. length by 6 in. girth; branches grey and smooth, branchlets, etc., hispid, glabrescent; bark 2 lin. thick, grey; leaves obovate-oblong to oblong-lanceolate, tapering in a short glabrous petiole of about ½-1 in. in length, shortly acuminate, 5-7 in. long, crenate-toothed and very scabrous along the thickened margins, of a harsh and brittle texture, more or less distinctly wrinkled, above very rough from very short stiff hairs arising from conical protuberances, often turning glabrescent, beneath pale-coloured and glabrous or nearly so; flowers conspicuous, pale yellow, forming dense, leafy-bracted, more or less glandular-hairy spikes on longer or shorter glandular-hairy or glabrous peduncles in the axils of the upper leaves or more or less crowded at the end of the branches so as to form a sort of panicle; bracts oblong-lanceolate, leafy, almost caudate-acuminate, nearly an inch long, especially along the margins villous or glandular-villous, uniformly green; bractlets 2, as long as the calyx or a little longer, linear-lanceolate, acuminate, glandular-pilose; calyx-segments nearly equal, about 7 lin. long, conform to the bractlets, but more densely pilose from long, white, glandular hairs; corolla about 1-1⅓ in. long, puberulous outside, villous within, pale yellow, the tube slender and as long as the inflated part, curved, the lobes short and rotundate; capsules somewhat longer than the calyx, linear-lanceolate, acute, puberulous, hardly 4-cornered, 6-8-seeded.

Hab.—Frequent in the tropical forests all over Pegu and Martaban down to Tenasserim.—Fl. Jan.-May.—s.—SS.=SiS. Metam.

Remarks.—Wood very pale brown, rather heavy, close-grained.

2. **S. Simonsii,** T. And.—An evergreen shrub up to 12 ft. high, with a simple stem up to 3-4 ft. length by 6 in. girth, the crown spreading and flat, branches more or less glandular-pubescent; leaves obliquely lanceolate to oblong-lanceolate, at the unequal base tapering into a glandular-puberulous petiole ½-1 in. long, acuminate, 4-6 in. long, serrate, membranous, above sprinkled with short hairs, beneath puberulous; flowers blue, forming a leafy-bracted glandular-puberulous head on a longer or shorter peduncle, solitary or by 2 or 3 in the axils of the leaves and shorter than them; outer bracts leafy and large, lanceolate and bluntish acuminate, glandular-pubescent; bractlets linear-lanceolate, about 6 lin. long, glandular-puberulous and ciliolate; calyx-segments 6-7 lin. long, linear, narrowed towards the base, ciliate; corolla blue, about twice as long as the calyx, funnel-shaped, glabrous; capsules glabrous, nearly as long as the calyx-segments, 4-seeded.

Hab.—Not unfrequent in the tropical forests of Martaban down to Upper Tenasserim; also in those round Kambala toung of the Yomah.—Fl. Feb.—Fr. Feb.—s.—SS.=SiS. *Metam.*

Remarks.—Wood white (the heartwood medullary), rather light, very soft, but close-grained, of a fine silky fibre.

3. **S. lamioides,** T. And.—An evergreen shrub, the branches slightly 4-cornered or almost terete, glandular-puberulous or pubescent; leaves ovate, rotundate at base, tapering into a short petiole, acuminate, 3-4 in. long, coarsely crenate-toothed, membranous, glabrous or nearly so above, beneath (especially along the nerves) slightly hirsute; flower-heads dense, on short peduncles, involucred by several unequally large leaves, the latter conform to the stem-leaves, but smaller and shorter petioled or almost sessile; inner bracts leafy, spatulate, long-ciliate towards the base; bractlets linear, acute, a little appressed-hirsute and ciliate; calyx deeply 5-cleft, the segments lanceolate, acuminate, pilose-ciliate, nearly 4 lin. long; flower-buds densely yellowish hirsute; corolla about 8-10 lin. long, bluish purple, pubescent outside, hirsute within and densely pubescent along the adnate part of the filaments; capsule a little longer than the calyx, broadly obovate-lanceolate, hirsute towards the apex, 4-seeded; seeds large, shortly tomentose.

Hab.—Not uncommon in the tropical forests of the Martaban hills, at 2,000 to 4,000 ft. elevation.—Fl. March.—s.—SS.=Metam.

4. **S. fimbriata,** N.E.—An evergreen glabrous shrub, 4-8 ft. high, the young branchlets sometimes slightly puberulous; leaves lanceolate to oblong-lanceolate, acuminate, tapering into a pubescent glabrescent petiole ½-1½ in. long, bluntish toothed, 5-9 in.

long, membranous, on both sides, but especially along the nerves beneath, sprinkled with very minute hairs; flowers sessile, at first forming densely bracted, sessile, solitary spikes in the axils of the leaves or at the end of the branchlets, but the spikes soon elongating to 2-4 inches and becoming very loose, interrupted and shortly peduncled; lower bracts, or rather reduced floral leaves, somewhat leafy, very deciduous, about ½ in. long or longer, sparingly ciliate or naked, entire, acuminate, minutely appressed-hispid, the true bracts lanceolate to linear-lanceolate, as long or shorter than the calyx, entire and very acuminate, minutely appressed-hispid; bractlets 2, as long as the bracts, linear-lanceolate, acuminate, narrowed at base, minutely appressed-hispid; calyx-segments ⅔-1 in. long, conform to the bractlets, but ciliate from stiff brownish hairs; corolla about an inch long, purple, glabrous; filaments and style densely tawny-villous, the former far decurrent along the tube; capsules linear-club-shaped, solid at the narrowed sterile part, about an inch long, glabrous and striate, 4-seeded; seeds large, grey, silk-hairy.

Hab.—Rare in the tropical forests of the eastern slopes of the Pegu Yomah; Tenasserim.—Fr. Feb.—s.—SS.=SiS.—*Metam.*

5. **S. Neesii,** Kz.—A leaf-shedding large shrub, 6-12 ft. high, the branchlets shortly pubescent, but soon turning quite glabrous; leaves lanceolate to oblong-lanceolate, shortly acuminate, tapering in a ½-1½ in. long petiole, obsoletely repand-toothed, 5-7 and often up to 10 in. long, membranous, on both sides sprinkled with minute appressed hairs and shortly pubescent beneath along the midrib; flowers forming dense bracted sessile spikes which soon elongate into an interrupted lax one in the axils of the leaves or at the end of the branches; lower bracts or rather reduced floral leaves leafy, very deciduous, about half an inch long or longer, fringed with dark-brown bristly hairs, cut and serrate towards the apex, the true bracts oblong-linear, shorter than the calyx, usually with a few serratures towards the apex, very acuminate, glandular-pilose; bractlets 2, as long as the calyx, linear-lanceolate, acuminate, narrowed at the base, glandular-hairy; calyx-segments about 6 lines long or longer, linear, minutely canescent-pubescent, ciliate, glandular-hairy at the acumination; corolla 1¼-1½ in. long, purple, glabrous, pubescent along the double-fold inside at the throat of the lower lobe, the tube long and slender; stamens 2 only; filaments glabrous, filiform and very far decurrent on the tube; style hairy; capsules linear-club-shaped, solid at the narrowed sterile part, somewhat longer than the calyx, sparingly hairy at the apex, 4-seeded; seeds large, grey, silk-hairy.

Hab.—Along streamlets in the tropical forests of Martaban, east of Tounghoo.—Fr. March.—s.—SS.=Metam.

PHLOGACANTHUS, N.E.

Calyx 5-parted, the segments linear, equal. Corolla curved, obliquely 2-lipped, the upper lip broader, longer and 2-cleft, the lower 3-cleft. Stamens 2, with or without 2 minute staminal rudiments; anthers 2-celled, the cells parallel, afterwards hastately diverging. Stigma simple, acute; ovary-cells 4-ovuled. Capsule compressed-linear, 4-8-celled from near the base.—Shrubs or undershrubs, with entire leaves. Flowers often showy, in terminal or lateral, simple or branched racemes or spikes. Bracts narrow.

* *Calyx and racemes velvety or puberulous.*

○ All parts glabrous.

Flowers yellowish brown . . . . . *Ph. thyrsiflorus.*
Flowers white or faintly rose-coloured . . . . *Ph. vitellinus.*
Flowers purplish crimson, 1½-2 in. long, tubular . . . *Ph. curviflorus.*

○○ Not glabrous.

Petioles and nerves beneath minutely puberulous, the former very long . . . . . *Ph. pulcherrimus.*
All parts more or less glandular-tomentose . . . . *Ph. cymosus.*

** *Calyx and racemes quite glabrous.*

Flowers more than an inch long; branches white . . . *Ph. insignis.*
Flowers only 4-5 lin. long, shortly pedicelled; branches green, sharply 4-gonous . . . . . *Ph. elongatus.*

1. **Ph. thyrsiflorus,** N.E.—An evergreen branched shrub, 6-10 ft. high, all parts glabrous, the branches with 4 elevated lines or almost 4-cornered; leaves cuneiform-oblong to lanceolate, shorter or longer petioled, acuminate, 6-10 in. long, entire, firmly membranous, quite glabrous; spikes straight, more or less elongate, thyrsoid, appressed tawny-pubescent, terminal and in the axils of the upper leaves; bracts and bractlets all subulate-linear, appressed-pubescent, the former longer; flowers conspicuous, on short pubescent pedicels; calyx appressed-pubescent, the segments linear-subulate; corolla about an inch long, yellowish brown or ochre-coloured, velvety on the outside and limb, villous along the curved insertion of the glabrous filaments; style glabrous; stigma subulate; capsules rather woody, fully an inch long, 4-cornered, furrowed, blunt and callose at the apex; seeds 8 or fewer, shortly stuppose.

Hab.—Ava and Martaban.—Fl. Feb.-March.

2. **Ph. insignis,** Kz.—An evergreen meagre shrub, 3 to 5 ft. high, all parts glabrous, the stems almost terete with 4 elevated lines, white; leaves cuneate-oblong to oblong, shortly acuminate, shortly petioled, entire, membranous, quite glabrous, 7 to 8 in. long; flowers dark violet, in terminal racemes or rarely forming terminal contracted panicles, the racemes about 2-3 times longer than the petiole, minutely puberulent or glabrous; bractlets linear,

acuminate, minutely puberulous, half as long as the 2 lin. long pedicels; calyx somewhat spherical at the base, the segments linear, acuminate, coriaceous, slightly puberulent, about 2 lin. long; corolla an inch long, puberulous, the tube wide, of the length of the calyx, shortly golden-villous at the throat within and at the insertion of the filaments, the lobes lanceolate, acute, the uppermost ones shorter; filaments and style glabrous; stigma truncate; capsules woody, quite similar to those of *Phl. thyrsiflorus*, an inch long, about 10-seeded.

Hab.—Frequent in the tropical forests around the Kambala toung and along the eastern slopes of the Pegu Yomah, up to 3,000 ft. elevation.—Fl. Feb.-March; Fr. Apr.—s.—SS.=SiS.

JUSTICIA, L.

Calyx divided to near the base into 5 or 4 equal segments. Corolla with a long or short tube, 2-lipped, the upper lip erect, concave, entire or notched, the lower 3-lobed. Stamens 2; anther-cells oblique or almost distinct and superposed, the lower one usually mucronate or spurred. Ovary-cells 2-ovuled; style usually entire or minutely capitate. Capsule 2-4-seeded, narrowed into a compressed sterile base. Seeds deeply cordate, marginate, supported by strong hooked seed-bearers.—Shrubs or herbs. Flowers solitary or in clusters or cymes, axillary, or forming terminal spikes or panicles. Bracts various.

* *Lower anther-cell spurred or mucronate; bracts inconspicuous, shorter than the calyx.*

Flowers in terminal spikes; all parts glabrous . . . . *J. Gendarussa.*

* * *Bracts decussate, ½-1½ in. long, conspicuous.*

○ Bracts uniformly green, from orbicular to ovate and lanceolate; capsule glabrous.

Leaves long-petioled; spikes on long stiff peduncles; bracts orbicular to ovate, glabrous, 1-flowered . . . . . *J. Adhatoda.*

Leaves shortly petioled, usually somewhat blunt; spikes on very short peduncles or almost sessile; bracts orbicular to ovate, minutely puberulous, 3-4-flowered . . . . . *J. ventricosa.*

○ ○ Bracts white, with green nerves, acuminate; a more or less pubescent undershrub . . . . *J. Betonica.*

1. **J. Gendarussa**, L.—*Bawa-nek.*—An evergreen dense shrub, 2-4 ft. high, all parts quite glabrous, the branches terete and thickened at the nodes; leaves linear-lanceolate or lanceolate, tapering at both ends, very shortly petioled, blunt or nearly so, almost coriaceous, entire or obsoletely repand, 4-5 in. long, glabrous; spikes terminal, glabrous, on longer or shorter peduncles; bracts linear, 1-2 lin. long; flowers in small clusters; calyx small, the segments linear, stiff, about a line long; corolla ½ an in. long or somewhat longer, glabrous, pale-greenish white and sparingly stained with purple, the tube rather slender, upper lip concave,

2-toothed, lower lip explanate, 3-lobed; capsules lanceolate, ½ in. long, 4-seeded.

Hab.—Not unfrequent in the tropical forests of Martaban and Tenasserim, especially along rocky streamlets; also Ava and Andamans.—Fl. Feb.-May.—s.—SS.=*Metam.* SiS.

2. **J. Adhatoda,** L.—An evergreen large shrub, sometimes growing out into a small tree, 15-20 ft. high, with an ash-coloured pretty smooth trunk, all parts glabrous; leaves elliptically to ovate-lanceolate, acuminate at both ends, on a ½-1 in. long petiole, 5-6 in. long, entire, almost coriaceous, quite glabrous; spikes solitary and axillary in the axils of the uppermost leaves, on 2-3 in. long, glabrous peduncles; bracts large, about ⅔-¾ in. long, 1-flowered, ovate, acute, smooth, rather coriaceous; bractlets half as long, almost lanceolate, minutely ciliate; calyx minutely puberous, the segments lanceolate; corolla about an inch long, white, minutely rusty-dotted, sparingly pubescent outside, the upper lip concave and notched, longitudinally purple-streaked, the lower lip 3-lobed, on the fold transversely purple-streaked; capsule ⅔ in. long, velvety-puberulous, the valves deeply 1-furrowed on the back.

Hab.—Ava, Prome, and Chittagong, cultivated.—Fl. Jan.-Feb.

3. **J. ventricosa,** Wall.—An evergreen shrub, 3-5 ft. high, all parts glabrous; leaves oblong-lanceolate, shortly petioled, acuminate at both ends, 5-8 in. long, almost entire, fleshy-coriaceous, glabrous and glossy; spikes solitary in the axils of the uppermost leaves, on very short peduncles or almost sessile, glabrous; bracts ventricose-concave, about ½-1 in. long, orbicular to broadly ovate, acute, 3-4-flowered, minutely puberulous and ciliolate; bractlets subulate, puberulous; calyx short, pubescent, the segments linear, acuminate; corolla nearly an inch long, slender, pubescent outside, white, purple-dotted, the upper lip concave and minutely 2-toothed, the lower lip 3-lobed and transversely purplish streaked on the centre.

Hab.—Tenasserim.—Fl. Feb.-Apr.

PEDALINEÆ.

Flowers irregular or almost regular. Calyx 5-lobed or divided into 5 segments. Corolla tubular to funnel-shaped, 5-lobed, the lobes spreading, imbricate or rarely valvate, often disposed in 2 lips, of which the lowermost usually larger. Stamens rarely 5, usually 4, with a rudimentary fifth one and didynamous, or very rarely only 2 perfect; anthers 2-celled, the cells opening longitudinally. Ovary of 2, or rarely 3 or 4 carpels, but often divided, at least after flowering, into twice as many spurious cells, either with

several superposed ovules in a single or several rows, or rarely solitary in each cell; style filiform, with as many stigmatic lobes as carpels or undivided. Fruit dry, hard and indehiscent, or opening in valves. Testa thin, often of elegant structure. Albumen scanty or none, rarely copious.—Herbs or shrubs, rarely trees, with opposite, entire, lobed or digitate leaves. Flowers solitary in the axils of the leaves or bracts, or in terminal racemes. Bractlets present or not.

A small order of which only 3 species occur in Burma. Til (*Sesamum Indicum*) is largely cultivated for its oil-yielding seeds.

* *Seeds winged.*
Stamens 5; calyx-lobes free to the base . . . . . *Gelsemium.*
Stamens 4, didynamous; calyx gamosepalous . . . . *Brandisia.*
* * *Seeds not winged* . . . . . *Buddleia.*

GELSEMIUM, Juss.

Calyx 5-parted, imbricate in bud. Corolla funnel-shaped, the limb 5-lobed, imbricate. Stamens 5, adnate to the base of the corolla; anthers 2-celled, the connective terminating in a mucro. Ovary 2-celled, very shortly stalked, with numerous amphitropous 2-seriate ovules along the ventral placentas; style filiform; stigmas 2, 2-cleft. Capsule elliptical to oblong, somewhat compressed, 2-celled, with a very narrow dissepiment, dehiscing septicidally, the valves keeled, half 2-cleft at the apex. Seeds compressed, nearly all round extended in a broad often lacerate wing. Embryo straight in the axis of the fleshy albumen; cotyledons ovate, much shorter than the radicle.—Scandent shrubs, with opposite leaves. Flowers in axillary cymes or terminal panicles.

1. **G. elegans,** Bth.—An evergreen scandent shrub, all parts glabrous; leaves ovate to ovate-lanceolate, acuminate, rounded or obtuse at the often somewhat unequal base, on a slender 2-3 lin. long petiole, 2-3 in. long, membranous, entire, glabrous; flowers rather small, on slender minutely pubescent or glabrous pedicels, in axillary, solitary, long-peduncled, brachiate, glabrous cymes usually collected in a sort of panicle at the end of the branchlets; calyx minutely pubescent; corolla funnel-shaped, about $\frac{1}{3}$ in. long or longer; capsules $\frac{1}{2}$ an in. long, oblong and depressed along the dissepiments, tumidly inflated, retuse with a mucro or acute, glabrous; seeds numerous, minutely tubercled, the wings broad and lacerate-lobed.

Hab.—Ava, Kakhyen hills.—Fr. March.

BRANDISIA, H.f. & Th.

Calyx bell-shaped, 5-ribbed, almost equally 5- (7-) -toothed. Corolla 2-lipped-funnel-shaped, the upper outer lip large, almost

truncate, the lower deeply 3-lobed. Stamens 4, inserted near the base of the corolla-tube, didynamous; filaments glabrous; anthers rotundate, 2-celled, pilose-fringed. Ovary 2-celled, with many ovules along the dilated placentas; style filiform; stigma ligulate. Capsule 2-valved, many-seeded. Seeds linear, at both ends elongated in a narrow wing.—Shrubs, with opposite leaves. Flowers solitary in the leaf-axils, the pedicels 2-bracteoled.

1. **B. discolor,** H.f. & Th.—An evergreen, meagre, half-scandent shrub, the younger parts shortly tomentose; leaves lanceolate, rounded at the base, on a mealy-puberulous petiole 3-4 lin. long, acuminate, 1-2 in. long, entire, thin-coriaceous, glabrous above, beneath shortly tomentose; flowers dull purplish-brown, on ½ in. long tawny-tomentose pedicels arising singly or very rarely by pairs from the axils of the leaves; calyx 3 lin. long, shortly tawny-tomentose; corolla ¾ in. long, tawny-tomentose, especially outside; capsules oval, acute, about twice as long as the calyx, nearly ½ in. long, tawny-tomentose; seeds linear, 2 lin. long.

Hab.—Rather frequent in the moister hill forests of Martaban, at 3,000 to 6,000 ft. elevation.—Fl. Fr. March.—s.—SS.=Metam.

BUDDLEIA, L.

Calyx 4-toothed or almost 4-cleft. Corolla almost bell-shaped to tubular-salver-shaped, the limb 4-lobed, the lobes short, spreading or nearly erect. Stamens 4; anthers almost sessile at the throat of the corolla, or the filaments longer and inserted half way up in the tube. Ovary 2-celled; style entire, clavate at the apex, the stigmatic portion thick, capitate or 2-lobed. Capsule septicidally 2-valved, the valves 2-cleft or almost entire, hiding the placentiferous column with its inflexed borders. Seeds numerous, small, compressed spindle-shaped or discoid, the testa often expanded in a membranous wing. Embryo usually small.—Shrubs or herbs, rarely trees, often tomentose or otherwise hairy, with opposite leaves. Flowers in axillary cymes or more usually in terminal often thyrsoid panicles or racemes.

Flower-clusters sessile, in slender panicled racemes; corolla-tube short and wide . . . . . *B. Asiatica.*
Flower-clusters peduncled, in more or less compact thyrsoid panicles; corolla-tube slender, 2½-3 lin. long . . . . *B. paniculata.*

1. **B. Asiatica,** Lour.; Bedd. Sylv. Madr. 143, t. 21, f. 4; Brand. For. Fl. 318.—*Kyoung-mee-koo.*—An evergreen large shrub, 3 to 6 ft. high, sometimes growing out in a little tree up to 15 ft. high, the younger parts velvety puberulous; leaves lanceolate to ovate-lanceolate, acuminate, acute at the base and tapering into a short velvety-puberulous petiole, minutely toothed, membranous, glabrous

above, beneath covered with a thin whitish or tawny appressed tomentum; flowers small, white, very shortly pedicelled or almost sessile, in small clusters, forming terminal and axillary racemes often arranged into trichotomous, brownish or whitish tomentose panicles; calyx tomentose; corolla white, puberulous, salver-shaped, the limb shortly 4- or 5-lobed; capsules oblong, 2-valved, about 2 lin. long.

Hab.—Common, especially in deserted toungyas, savannah forests and along river banks, all over Burma and the adjacent provinces down to Tenasserim.—Fl. Jan.-Feb.; Fr. H.S.—l.—SS.=∞. *All.*

2. **B. paniculata,** Wall.—A tawny-tomentose shrub; leaves ovate-lanceolate to lanceolate, acuminate at both ends, on a rather slender tawny or rusty tomentose petiole up to ½ in. long or longer, 2-3 in. long, entire or slightly serrate upwards, thick-membranous, above glabrescent and more or less wrinkled, beneath tawny or rusty tomentose; flowers small, sessile, clustered, the clusters shortly peduncled and forming a more or less compound thyrsoid rusty-tomentose panicle at the end of the branches and in the axils of the upper leaves; calyx rusty-tomentose, about a line long; corolla tubular, the tube about 3 lin. long, tomentose outside, the lobes spreading, very short, rotundate.

Hab.—Ava, Kakhyen hills.—Fl. March.

VERBENACEÆ.

Flowers irregular or rarely regular. Calyx persistent, truncate toothed or lobed. Corolla 4- or 5- rarely 6-8-lobed, or rarely truncate, the lobes more or less 2-lipped, or nearly or quite equal, imbricate in bud, the upper lip or uppermost lobe or sometimes the lateral ones outside. Stamens inserted in the corolla-tube, usually 4 in pairs, or nearly equal and alternating with its lower lobes, or, when the corolla is regular, 4 to 8 alternating with its lobes; anthers 2-celled, the cells usually parallel and opening longitudinally. Ovary not lobed or only shortly 4-lobed, usually more or less perfectly divided into 2 or 4 cells or half-cells, with a solitary ovule in each cell or half-cell, either anatropous and erect from the base, or more or less amphitropous and attached laterally or near the top so as to appear pendulous; style terminal, simple, entire, or more frequently with 2 short stigmatic lobes. Fruit dry or more or less drupaceous, the whole fruit or the endocarp separating into 2 or 4 nuts or pyrenes or quite indehiscent and 2 or 4-celled, and sometimes with an additional central cavity between the carpels having the appearance of a third or fifth empty cell. Seeds solitary in each cell or half-cell, erect, usually without albumen. Embryo straight, with thick cotyledons and an inferior radicle.—Herbs,

shrubs, or trees, with opposite whorled or rarely alternating leaves, entire or divided. Stipules none. Inflorescence various.

A large order represented in Burma by about 60 species. By far the most important to the forester on account of teak being included in it. Besides this tree others yield good timber.

* *Seeds with integuments, not germinating while on the plant.*
× Ovules ascending from the base of the cells; flowers without bractlets; fruit a drupe.
Flowers in heads or cymes; drupe of two 1-celled pyrenes . . *Lantana.*
×× Ovules laterally attached above the base or near the summit of the cells; flowers usually supported by 2 bractlets.
○ Cymes involucred. Capsule coriaceous, indehiscent.
Involucre 6-8-phyllous; corolla-limb regular, 5-12-cleft; style very short; stamens as many as corolla-lobes. . . . . *Symphorema.*
Involucre 3-phyllous; corolla 2-lipped, the upper lip elongate; stamens 4, didynamous; style capillary, exserted . . *Congea.*
○○ Inflorescence without involucre.
+ Ripe capsules separating into 4, or by abortion fewer, valves.
† Calyx very ample, orbicular-explanate; corolla tubular-2-lipped . . . . . *Holmskioldia.*
†† Calyx more or less cup- or bell-shaped.
△ Fruiting calyx not winged.
Corolla 2-lipped . . . . . *Caryopteris.*
Corolla salver-shaped . . . . . *Glossocarya.*
△△ Fruiting calyx 4-winged, bladdery . . *Hymenopyramis.*
++ Fruit indehiscent, dry or drupaceous.
† Nut dry, spongy-villous, included in the enlarged calyx . . . . . *Tectona.*
†† Drupe more or less sappy or fleshy.
△ Drupe containing a single 4- or by abortion fewer-celled nut.
Corolla small; drupe small, sappy; flowers in cymes, rarely panicled . . . . . *Premna.*
Corolla usually large; drupe large, fleshy; flowers in racemes, rarely panicled . . . . . *Gmelina.*
△△ Drupe containing 2-4 distinct 1-celled nuts or kernels; stamens exserted.
‡ Style shortly 2-lobed.
|| Corolla-tube longer than the limb.
Drupe almost dry, separating in 2 or 4 valve-like woody nuts . *Volkameria.*
Drupe sappy, 4- or by abortion 1-3-lobed . . . . . *Clerodendron.*
|| || Corolla-tube shorter than the limb.
Flowers usually panicled; leaves often digitate, rarely simple . *Vitex.*
‡‡ Style capitate.
Corolla-tube very short, the limb almost regular; drupe containing four 1-celled nuts . . . . . *Callicarpa.*
** *Fruit a 2-valved capsule; seed solitary, without integuments, germinating while on the plant; cotyledons large, folded* . . . . . *Avicennia.*

LANTANA, L.

Calyx very shortly tubular or almost bell-shaped, obscurely 4-toothed. Corolla tubular-funnel-shaped with the tube slightly

widened at the throat, the limb oblique and almost 2-lipped, the upper lip entire or 2-cleft, the lower one 3-cleft. Stamens 4, didynamous, inserted and included in the corolla-tube; anther-cells dehiscing longitudinally. Ovary 2-celled, with a solitary erect ovule in each cell; style short and filiform, with a linear or obliquely capitate stigma. Drupe fleshy or succulent, usually supported by the enlarged withered calyx, containing a hard 2-celled putamen or dividing into two 1-celled nuts.—Shrubs or rarely undershrubs, with 4-cornered branches, usually more or less scabrous or aculeate, with opposite or whorled aromatic leaves. Flowers in dense pedunculed heads or spikes.

Branches, etc., usually aculeate along the corners; nuts, if not entirely, at least at the base separated by a spongy mass . *L. miata.*
All parts greyish pubescent, no thorns; nuts connate in an entire putamen . . . . . *L. alba.*

1. **L. mixta,** L.—An evergreen large shrub with spreading 4-cornered branches, unarmed or sprinkled with straight or curved thorns along the corners; leaves cordate-ovate to ovate-oblong, somewhat decurrent at the base, acuminate, serrate-crenate, veined and wrinkled, above rough from short stiff hairs, beneath pale-coloured and more or less greyish pubescent; flowers small, changing colour from white and bluish white to yellow and finally to orange and red, arranged in short long-peduncled axillary heads; bracts linear-lanceolate, hairy, the lower ones of the length of the corolla-tube, those further up gradually smaller and shorter; drupes purplish black, smooth, the size of a small pea.

Hab.—A Brazilian plant, cultivated all over Burma, and sometimes like wild around habitations.

2. **L. alba,** Mill.; Brand. For. Fl. 369.—An evergreen low shrub, with simple or slightly branched 4-cornered stems, all parts more or less greyish pubescent; leaves ovate-oblong to broadly ovate, more or less tapering into a short petiole, acuminate, serrate, much wrinkled, 1-2 in. long, on both sides scabrously pubescent from short almost greyish hairs; flowers small, white, yellow at the throat, arranged in dense rather short-peduncled axillary heads elongating usually into spikes; bracts broadly obovate to elliptically ovate, acuminate, half as long as the corolla-tube, the lower ones spreading and forming a spurious involucre; drupes purplish black, the size of a small pea.

Hab.—Burma, according to Rev. Dr. Mason (probably Ava).

SYMPHOREMA, Roxb.

Involucre 6-8-phyllous, spreading, usually longer (rarely shorter) than the contracted small cyme. Calyx more or less bell-shaped,

5-cleft or 6-8-toothed, or tubular-2-lipped with the lips entire or slightly 2-toothed, persistent. Corolla tubular-salver- or funnel-shaped, almost regular, the limb 5-18-cleft, the segments linear to obovate. Stamens as many as corolla-lobes, inserted at the throat, included or exserted; filaments short or filiform; anthers dorsifix, 2-celled. Ovary 2-celled, with 2 erect collateral ovules in each cell; style filiform or short; stigma 2-cleft. Capsule coriaceous, indehiscent, enclosed in the somewhat inflated calyx, 1-seeded by abortion. Cotyledons thick, oily, the radicle short, inferior.—Scandent shrubs, with opposite simple leaves. Flowers rather small, in involucred small cymes on shorter or longer axillary peduncles often collected into larger panicles at the end of the branchlets.

* *Involucre shorter than the calyces.*

Leaves entire, shortly tomentose or pubescent beneath . . *S. grossum.*

* * *Involucre much longer than the calyces, the leaflets an inch long or longer.*

○ Ovary smooth; leaves more or less pubescent, at least beneath.

Leaves coarsely toothed, like the inflorescence greyish pubescent beneath . . . . . *S. involucratum.*

Leaves entire, tawny or brownish pubescent beneath; inflorescence tawny or rusty pubescent . . . . . *S. unguiculatum.*

○ ○ Ovary pubescent or villous; leaves glabrous or nearly so; cymes collected into terminal panicles.

Calyx pilose-tomentose; corolla-throat glabrous . . . . *S. pentandrum.*

Calyx glabrous; corolla-throat woolly . . . . . *S. Jackianum.*

1. **S. grossum,** Kz.—An evergreen, large, scandent shrub, with brown stems, the younger parts more or less shortly tomentose; leaves elliptically lanceolate to oval and oval-oblong, acute at the unequal base, on a puberulous or tomentose petiole 3-5 lin. long, acute or bluntish, 3-4 in. long, membranous, glabrous above, beneath shortly whitish tomentose to pubescent, entire or obscurely waved; flowers rather small, but showy, pure white, sessile, in small almost sessile clusters supported by a small involucre consisting of 6 unequal spatulate-lanceolate tomentose leaflets shorter than the calyces, the clusters arranged in short, axillary, simple or trichotomously branched racemes; calyx 5-6-toothed, yellowish or whitish tomentose, densely silk-hairy within, in fruit globular-inflated; corolla-limb 5- or 6-lobed, the lobes oblong, blunt, puberulous.

Hab.—Frequent in the swamp forests, along choungs in marshy wooded places, not only in the Irrawaddi valley of Pegu, but also from Martaban down to Tenasserim.—Fl. Apr.—s.—SS.=All.

2. **S. involucratum,** Roxb.—*Nway-sat.*—A leaf-shedding, large, woody climber with cylindrical stem, the young shoots more or less greyish or whitish pubescent; bark about 3 lin. thick, grey, peeling off in little flakes; leaves obovate-oblong to obovate and elliptical, acute or obtuse at the base, on a pubescent petiole 2-4

lin. long, bluntish apiculate or bluntish, coarsely and irregularly repand-toothed, membranous, softly pubescent, more or less glabrescent above, 3-4 in. long; flowers small, white, sessile, in small clusters supported by an involucre consisting of 6 obovate greenish then cream-coloured pubescent blunt leaflets of nearly an inch in length or rarely twice the length of the calyx, the cymes arising from short shoots above the axils of the fallen leaves; calyx greyish or whitish tomentose, 6-8-toothed; corolla-limb 6-8-cleft, the lobes linear-lanceolate, acute; capsules glabrous, enclosed in the inflated calyx.

Hab.—Common, chiefly in the mixed forests, all over Ava, Martaban and Pegu.—Fl. March-Apr.—s: l. and l.—SS.=∞*SiS. All.*

Remarks.—Wood grey, close-grained, rather heavy.

3. **S. unguiculatum,** Kz.—*Ka-nway.*—A leaf-shedding, large, scandent shrub, with twisted stems as thick as the arm, the young shoots rusty-pubescent; bark greyish, corky-lamellate; leaves ovate to ovate-oblong and ovate-lanceolate, obtuse or rounded at the base, on a rather short rusty-pubescent petiole, shortly acuminate, acute or apiculate, 4-5 in. long, entire, thin-coriaceous, while young on both sides, afterwards beneath only, brownish pubescent; flowers rather small, cream-coloured, sessile, in small cluster-like cymes supported by an involucre of 6 spatulate-lanceolate rusty-tomentose leaflets of nearly an inch in length, the cymes on shorter or longer peduncles and arranged in loose tawny-pubescent panicles at the end of the branchlets; calyx rusty- or tawny-tomentose, varying from 4-5-toothed to 2-lipped with the lips entire or slightly 2-toothed; corolla-limb with as many obovate blunt lobes as calyx-teeth, the throat pubescent; capsules globular, the size of a pea, glabrous, enclosed in the calyx.

Hab.—Frequent in the mixed forests from Pegu and Martaban down to Tenasserim and the Andamans; occasionally entering the drier hill forests up to 3,000 ft. elevation.—Fl. Dec.-Jan.; Fr. Apr.—l.—SS.=∞ *SiS.*

4. **S. pentandrum,** Kz.—A large scandent shrub, with more or less pubescent 4-cornered branchlets; leaves ovate to oblong-lanceolate, obtuse or rounded at the base, on a puberulous petiole 2-3 lin. long, acuminate, 2-4 in. long, chartaceous, entire, glabrous or slightly pubescent beneath and bearded in the axils of the nerves; flowers small, purple, sessile, in small clusters supported by an involucre consisting of 6 linear-oblong or oblong, glabrous, chartaceous leaflets of nearly an inch in length; calyx pilose, tomentose, bell-shaped, 5-cleft, the lobes 2-toothed, with a reflexed tooth in each sinus; corolla glabrous.

Hab.—South Tenasserim.

5. **S. Jackianum,** Kz.—A scandent shrub, the branchlets pubes-

cent-tomentose ; leaves coriaceous, shortly petioled, oblong, obtuse at the base, acuminate, glabrous, shining above, pubescent and glabrescent beneath, bearded in the axils of the nerves ; panicles large, brachiate, leafy below, with oblong bracts ; peduncles filiform, about the length of, or somewhat shorter than, the involucre, and, like it, thinly sprinkled with hairs ; leaflets of the involucre linear-lanceolate, sessile, blunt, hardly mucronate ; calyx glabrous, tubular-bell-shaped, 10-nerved, 5-toothed, and produced into a subulate tooth-like process in each sinus so as to appear 10-toothed ; throat of the corolla very woolly.

Hab.—Jungles of South Tenasserim.

CONGEA, Roxb.

Involucre 3-phyllous, spreading, supporting a sessile 6-9-flowered small cyme. Calyx tubular, widened at the mouth, 5-cleft, persistent. Corolla 2-lipped, the tube as long as the calyx ; limb very unequal, the upper lip elongate, erect and 2-cleft, the lower spreading and shortly 2-lobed. Stamens 4, didynamous, inserted at the throat and long-exserted ; filaments filiform ; anthers dorsifix, 2-celled. Ovary 2-celled, with 2 pendulous ovules in each cell ; style capillary with a 2-cleft stigma. Capsule coriaceous, indehiscent, 1-seeded by abortion.—Scandent shrubs with opposite leaves. Flowers in small involucred cymes arranged usually in terminal panicles.

1. **C. tomentosa,** Roxb.—*Tha-ma-ka-nway.*—A leaf-shedding, large, scandent shrub, the branchlets, etc., covered with a short soft tomentum ; leaves ovate to ovate-oblong, on a pubescent petiole 2-3 lin. long, obtuse or rounded at the base, 4-5 in. long, acute or somewhat acuminate, entire, above rough from short hairs, beneath shortly and rather softly tomentose, or rarely almost glabrous on both sides ; flowers whitish, sessile, in small clusters supported by a pale pinkish or white involucre, consisting of 3 shortly tomentose or velvety, oval to obovate-oblong, blunt or somewhat acute leaflets up to an inch long ; calyx thickly clothed with long hairs, the segments narrow-lanceolate and acute, or very short and almost blunt ; corolla-tube glabrous, or hairy within.

Hab.—Common in all kinds of forests except the littoral ones, all over Burma from Chittagong and Ava down to Tenasserim.—Fl. Dec.-Jan.—l.—SS.=∞.

HOLMSKIOLDIA, Retz.

Calyx membranous, usually red, the tube very short, the limb large, almost rotate-bell-shaped and spreading, entire or nearly so.

Corolla tubular-2-lipped, the tube elongate, slightly curved, somewhat dilated at the throat, the upper lip 2-cleft, with the lobes erect-spreading, the lower 3-cleft with short reflexed lobes. Stamens 4, didynamous, exserted. Ovary 4-celled, with a solitary almost pendulous ovule in each cell; style almost simple, with a short lateral lobe. Fruit a 4- or by abortion 3-2-lobed capsule surrounded at the base by the very large explanate calyx, and separating into as many 1-seeded valves as lobes.—Scandent shrubs, with opposite simple leaves. Flowers in short terminal panicles or spuriously axillary racemes.

1. **H. sanguinea,** Retz.; Brand. For. Fl. 370.—A large scandent shrub, the younger shoots puberulous; leaves more or less ovate to elliptically ovate, acute at the rounded base, on a slender puberulous petiole ½-1 in. long, 2-3 in. long, acuminate, slightly serrate, membranous, while young minutely pubescent beneath; flowers middling-sized, nearly an inch long, crimson, on long, slender, almost filiform minutely pubescent pedicels, forming a rather short, puberulous, little-branched panicle at the end of the branches or reduced to short racemes at the end of axillary short shoots; calyx about ⅔ in. in diameter, explanate-orbicular, glabrous, chartaceous and net-veined, turning green and finally brown with ripening of the fruit; capsule obovate, 4- or fewer-lobed, black, about 4-5 lin. long.

Hab.—Dry forests, especially the mixed ones of the Prome district; also Ava.—Fr. March.—l.—SS.=*CaS.* All.

GLOSSOCARYA, Wall.

Calyx cyathiform-bell-shaped, 4-5-toothed, with twice as many nerves as teeth. Corolla salver-funnel-shaped, with a slender tube, the limb nearly equal, 4-5-parted, spreading. Stamens 4 or 5, inserted in the corolla-tube and exserted. Ovary 2-celled, with 2 ovules in each cell suspended from the 2-lamellate spermophore; style filiform, with a 2-cleft stigma. Capsule surrounded by the somewhat enlarged calyx and half-exserted, opening into 2 valves, which again separate between the spermophores so as to let the capsule appear 4-valved.—Shrubs, probably scandent, with simple opposite leaves. Flowers small, in terminal corymb-like panicles.

1. **G. mollis,** Wall.—A shrub, the 4-cornered branches and younger parts greyish tomentose; leaves ovate or cordate-ovate, on short pubescent petioles, blunt with a mucro or almost acute, 3-4 in. long, entire, above obsoletely puberulous, beneath greyish and softly pubescent or almost velvety; flowers small, on short but slender puberulous pedicels, forming a rather ample, puberulous, corymb-like panicle at the end of the branches; calyx puberulous, about 1½ lin. long, the teeth short, broad and somewhat rounded

with a short point; capsules towards the apex sparingly hirsute from spreading hairs.

Hab.—Tenasserim and Ava. Fr. Nov.—SS.=Ca.

HYMENOPYRAMIS, Wall.

Calyx very small, 4-toothed, much enlarging after flowering. Corolla almost funnel-shaped with a short tube of the length of the calyx, the limb 4-parted, almost equal. Stamens nearly equal, inserted at the throat, exserted; anthers erect, 2-celled, the cells opening longitudinally. Ovary 2-celled, with 2 ovules in each cell suspended from a bilamellate spermophore; style capillary, with a 2-cleft stigma. Capsule globular, opening in 4 valves, enclosed in the much enlarged, chartaceous, 4-winged calyx and resting on a very elongate slender peduncle.—Scandent shrubs, with simple opposite leaves. Flowers minute, cymose, forming brachiate, terminal and axillary panicles.

1. **H. brachiata,** Wall.—*Chin-thea-lek-nway.*—A leaf-shedding, large scandent shrub, the branchlets, etc., greyish velvety; leaves ovate-lanceolate to ovate-oblong and ovate, on a slender densely puberous petiole 4-7 lin. long, more or less acute at the base, acuminate, 3-5 in. long, almost chartaceous, entire, glabrous above, beneath whitish or greyish velvety or shortly pubescent; flowers minute, white, on puberulous capillary short but in fruit very much (4-5 lin.) elongating pedicels, in small cymes arranged in a brachiate puberulous panicle at the end of the branchlets and in the axils of the upper leaves; corolla obliquely bell-shaped, 4-lobed; stamens long-exserted; fruiting calyx about 4 lin. long, oblong, 4-winged, chartaceous and veined, minutely puberulous; capsule globular, enclosed in the calyx, pilose.

Hab.—Common in the dry forests of Prome; also Ava.—Fl. Nov.; Fr. C.S.—l.—SS.=*CaS.* All. Dil.

TECTONA, L. f.

Calyx bell-shaped, 5-6-cleft. Corolla almost rotate or funnel-shaped, the tube nearly as long as the calyx, the limb 5-6-cleft, almost equal and spreading, hairy at the throat. Stamens 5-6, nearly equal, inserted in the corolla-tube, exserted; anthers cordate, 2-celled, the cells opening longitudinally. Ovary 4-celled, with a solitary ovule in each cell; style as long as the stamens; stigma sharply 2-cleft. Fruit a bony nut, densely vilious-tomentose, enclosed in the inflated calyx, 4-celled. Albumen none.—Trees, with opposite or ternate leaves. Flowers rather small, in terminal brachiate panicles.

Young branchlets 4-cornered; fruiting calyx bladdery, inflated . *T. grandis.*
Young branchlets 6-8-angular or rather furrowed; fruiting calyx ovoid, tightly embracing the nut . . . . . *T. Hamiltoniana.*

1. **T. grandis,** L. f.; Bedd. Sylv. Madr., t. 250; Brand. For. Fl. 354, t. 44.—*Kyoon-pen.*—A tree (70—100 + 60—70 + 12—15), remaining low and stunted in sterile grounds, leafless during H.S., all younger parts covered with a roughish, short, stellate tomentum; bark rather thin, spongy-fibrous and elongate-netted; cut dry; leaves ample, decussately opposite, ovate to ovate-oblong to obovate, at the base decurrent into a short and strong petiole, acute or rarely shortly acuminate, ½-1½ ft. long, especially while young more or less scabrously pubescent above, beneath shortly and densely stellate-pubescent; flowers small, white, copious, but only few of them fertile, on short minutely tomentose pedicels, forming brachiate corymbs arranged in a puberulous, ample, terminal panicle; corolla almost rotate, 5-6-lobed; calyx greyish or brownish tomentose, small, in fruit bladdery-inflated and nearly an inch in diameter, crowned by the 5-6-toothed mouth and enclosing a villous-tomentose, globular, bony, 4-celled nut.

Hab.—Common all over Burma from Ava and Martaban down to Upper Tenasserim, especially in the mixed forests, but also in all other deciduous forests, up to 3,000 ft. elevation.—Fl. begin. of R.S.; Fr. Nov.-Jan.—l.—SS. = ∞ *SiS.*

Remarks.—Wood pale brown, the heartwood darker-coloured, rather light, rather close-grained, very hard, but easy to work, strong and durable, while fresh rather oily, takes fine polish. □′=40-50; break-weight=190-289 pd. The teak is the best timber for ship and house-building, house-carpentry. A good oil is obtained in Hindustan, used as a substitute for linseed-oil in paints; yields also varnish. The leaves have been used and strongly recommended for dyeing silk yellow, olive, &c.

2. **T. Hamiltoniana,** Wall.—*Ta-nap.*—A leaf-shedding tree (30—40 + 8—15 + 3—4), the younger parts all shortly and densely tomentose, the branchlets 6-8-angular-furrowed; leaves often ternate, obovate to elliptically obovate, acute at the base, but not decurrent, on a shortly pubescent petiole 4-6 lin. long, shortly acuminate or acute, 5-7 in. long, rigidly chartaceous, above rough from short minute hairs, beneath shortly pubescent or, while young, shortly tomentose; flowers rather small, pale blue, on floccose-tomentose pedicels 1-2 lin. long, dichotomously corymbose and forming a tomentose panicle at the end of the branchlets; calyx tawny or yellowish floccose-tomentose, in fruit about 4 lin. long, ovoid, closely enclosing the small tomentose nut.

Hab.—Not unfrequent in the dry mixed forests of Prome and Ava.—Fl. July; Fr. Nov.-June—l.—SS.=CaS.

Remarks.—Wood uniformly pale brown, heavy, streaked, close-grained, and finely fibrous, takes fine polish.

PREMNA, L.

Calyx cup- or nearly bell-shaped, 4-5-cleft or -toothed, or almost 2-lipped, with the one or both lobes entire, persistent and a little enlarging. Corolla funnel-shaped, 2-lipped, with a short tube, the upper lip 2-cleft to near its middle, the lower 3-cleft or -parted; rarely the limb almost regular and reflexed. Stamens 4, didynamous or almost equal, usually as long as the corolla. Ovary 4-celled, with a solitary pendulous or laterally attached ovule; style filiform with 2 spreading stigmatic lobes. Drupe pea-like, sappy, containing a 4 or rarely by abortion 2-3-celled putamen. Seeds solitary, without albumen.—Trees or shrubs, sometimes scandent, rarely undershrubs, with opposite simple leaves. Flowers small, in terminal, trichotomous, corymb-like panicles or in cymes or clusters forming a terminal spike or raceme-like contracted panicle.

* *Flowers in corymbose cymes or panicles.*

○ Trees or erect shrubs, rarely undershrubs.

× Tomentose or velvety pubescent trees; calyx 5-toothed.

All parts stellate-tomentose; flowers in panicles . . . . *P. tomentosa.*

All parts velvety pubescent; flowers cymose, in corymbs . . *P. viburnoides.*

× × Almost glabrous trees; calyx 4-toothed.

Leaves glabrous, except the pubescent nerves; flowers cymose, in corymbs . . . . . *P. sambucina.*

× × × Shrubs or undershrubs erect; calyx 5-toothed, and often more or less 2-lipped; leaves toothed, at least towards the apex.

Glabrous; petiole 2-3 lin. long; corymbs and calyx glabrous . *P. esculenta.*

Glabrous or the shoots minutely puberulous, the leaves appearing sessile with a narrow rounded base; corymbs more or less puberulous . . . . . *P. amplectens.*

All parts softly and shortly puberulous, the leaves while young sessile . . . . . *P. macrophylla.*

○ ○ Scandent shrubs or climbers.

Leaves blunt, glabrous; calyx 4-toothed . . . . *P. serratifolia.*

Leaves acuminate, glabrous; calyx truncate . . . . *P. scandens.*

Leaves acuminate, more or less puberulous beneath; calyx 2-lipped and 5-toothed . . . . . *P. lucidula.*

× × *Flowers clustered or in little cymes, arranged into a more or less interrupted raceme or spike.*

Leaves glabrous or nearly so; flower-clusters sessile or nearly so . *P. racemosa.*

1. **P. tomentosa,** Willd.; Bedd. Sylv. Madr., t. 251; Brand. For. Fl. 367.—*Kyoon-naleng.*—A tree (30—50 + 15—30 + 3—5), shedding leaves in H.S., all softer parts tomentose from short stellate hairs; leaves elliptical to ovate-oblong and ovate, more or less rounded or emarginate at the base, on a more or less scurfy-tomentose petiole 1-4 in. long, acuminate or shortly acuminate, 6-12 in. long, chartaceous, above scurfy-tomentose and glabrescent, beneath more or less stellate-tomentose; flowers small, yellowish white, on short minutely tomentose pedicels, forming larger or smaller stellate-tomentose, brachiate, cymose panicles at the end of the branch-

lets; bracts linear, stellate-tomentose; calyx about a line long, 5-toothed, mealy-tomentose; corolla pilose at the throat, otherwise glabrous; drupes obovoid, about 2 lin. long, smooth, the putamen obsoletely tubercled.

HAB.—Frequent all over Burma from Ava and Martaban down to Tenasserim, in the dry and upper mixed forests up to 2,000 ft. elevation.—Fl. R.S.—l.—SS.=CaS. *SiS.* Metam.

REMARKS.—Wood yellowish, hard, close-grained, rather heavy and strong, the annual rings obsolete. Used for weaving shuttles and recommended as good for fancy work.

2. **P. viburnoides,** Wall.—A leaf-shedding tree (30—40 + 10—15 + 3—4), all softer parts velvety-tomentose; leaves elliptical to ovate, on a shortly pubescent petiole $\frac{1}{4}$-$\frac{2}{3}$ in. long, tapering at the rounded base, blunt to bluntish apiculate and bluntish acuminate, $1\frac{1}{2}$-3 in. long, entire or coarsely serrate-toothed to obsoletely serrate, membranous, shortly and softly pubescent above, almost velvety beneath; flowers greenish white, small, on very short pubescent pedicels, forming shortly tomentose short-peduncled or almost sessile brachiate cymes or corymbs at the end of the branchlets and of the short shoots in the axils of the leaves; bracts short, linear, puberulous; calyx cup-shaped, shortly 5-toothed, velvety; corolla sparingly pubescent, pilose at the throat; drupes globular, bluish black, smooth, the size of a pepper-kernel, the putamen tubercled.

HAB.—Frequent in the mixed dry forests of the Prome district and Ava.—Fl. March.—l.—SS.=CaS.

3. **P. sambucina,** Wall.—An evergreen tree (20—30 + 6—15 + 2—3), the young shoots pubescent or almost villous; leaves ovate to broadly ovate, on a pubescent petiole 3-5 lin. long, entire or repand-toothed towards the apex, apiculate or very shortly acuminate, 2-3 in. long, on both sides on the nerves pubescent, otherwise glabrous, rigidly membranous; flowers small, greenish white, on very short pedicels, forming a rather small, divaricate, short-peduncled, pubescent corymb at the end of the branchlets; bracts small, subulate; calyx about $\frac{1}{2}$ a line long, puberulous, cup-shaped, broadly 4-toothed; corolla 4-cleft, bearded at the throat.

HAB.—In moister upper mixed forests of Arracan; also Upper Tenasserim.—Fl. Oct.—s + l.—SS.=SiS.

4. **P. esculenta,** Roxb.—A shrub with a short stem, all parts glabrous; leaves elliptical to elliptically oblong and often narrowed at the rounded or unequal base, 2-4 in. long, acuminate, on a very short glabrous petiole 2-3 lin. long, coarsely serrate-toothed, membranous, glabrous; flowers small, yellowish white, on very short glabrous pedicels, forming a short-peduncled or almost sessile, glabrous, brachiate corymb at the end of the branchlets; bracts short,

subulate, glabrous; calyx glabrous, hardly a line long, unequally 5-toothed; corolla yellowish white with a golden blotch at the base of the middle-lobe, the throat pilose; drupes obovoid, globular, smooth, purplish, the putamen tubercled.

HAB.—Chittagong.—Fl. Fr. nearly ∞.

5. **P. amplectens,** Wall.—A leaf-shedding low undershrub, 1-2 ft. high, yearly sending up young flowering shoots, all parts glabrous or the young branchlets minutely puberulous; leaves obovate-oblong to almost obovate, more or less cuneate-narrowed towards the obtuse or rounded base, on a very thick glabrous or minutely puberulous petiole, 1-2 lin. long, 2-10 in. long, acute, serrate towards the apex, quite glabrous or minutely puberulous along the nerves, especially along those of the pale-coloured under-surface; flowers small, greenish white, on short minutely puberulous pedicels, forming a peduncled, brachiate, puberulous or glabrous corymb at the end of the branches; bracts short, linear-lanceolate; calyx about a line long, glabrous or nearly so, 5-toothed; corolla glabrous, the tube pubescent within; drupes almost globular, the size of a pepper-kernel, smooth, purplish, the putamen thin, obsoletely tubercled.

HAB.—Common in the mixed forests, especially in the upper and lower ones, from Pegu and Martaban down to Upper Tenasserim.—Fl. Fr. May-June.—SS.=∞.—*All.*

6. **P. macrophylla,** Wall.—A leaf-shedding low undershrub, 1-2 ft. high, yearly sending up flowering shoots after the jungle-fires, all parts shortly pubescent; leaves obovate-oblong to oblong-lanceolate, while young sessile with a rounded tapering base, full-grown on a thick puberulous petiole 1-2 lin. long, bluntish or acute, 6-12 in. long, crenate-serrate, pubescent and sometimes somewhat sticky, when full-grown softly puberulous above, and shortly pubescent beneath; flowers small, greenish yellow, on short pubescent pedicels, forming a longer or shorter peduncled, pubescent, rather compact corymb at the end of the branches; calyx cup-shaped, puberulous, 5-toothed, about a line long or shorter; corolla-throat bearded; drupes globular or nearly so, surrounded by the tubular puberulous calyx, enlarged and up to 3 lin. long, the size of a pepper-kernel, smooth, bluish black, the putamen tubercled, only 2-celled by abortion.

HAB.—Common in the low and Eng forests from Prome and Martaban to Pegu.—Fl. Fr. Apr.-June.—l.—SS.=Dil.—*Lat.*

7. **P. serratifolia,** L.; Bedd. Sylv. Madr. 172 (*P. integrifolia,* L.; Brand. For. Fl. 366).—An evergreen, scandent, straggling shrub, the stems often armed with opposite spine-like reduced branchlets, the young parts minutely puberulous; leaves obovate to obovate-oblong, acute to obtuse at the base, on a slender, glabrous

or slightly pubescent petiole $\frac{1}{3}$-$\frac{1}{2}$ in. long, blunt or obsoletely apiculate, 2-3 in. long, entire or nearly so, or rarely obscurely serrate, membranous, glabrous; flowers small, on very short puberous pedicels, forming a rather small peduncled puberulous corymb at the end of the branches; calyx puberous, about $\frac{1}{2}$ a line long, 2-lipped, with the one lip 2-toothed and the other entire; corolla-tube villous at the throat along the insertion of the stamens; drupes obovate, about a line long, smooth, the putamen tubercled.

Hab.—Frequent in the coast forests of the Andamans; also Tenasserim.—Fl. May-June.—s.—SS.=SiS.

8. **P. scandens,** Roxb.—An evergreen (?) scandent shrub, all parts glabrous or the young shoots minutely puberulous; leaves elliptical to ovate-oblong, rounded at the base, on a glabrous slender petiole $\frac{1}{2}$-1 in. long, 3-4 in. long, shortly acuminate or almost apiculate, entire, rigidly membranous, glabrous; flowers small, greenish or yellowish white, on very short puberulous pedicels, forming a short-peduncled, brachiate, puberulous cyme or corymb at the end of the branchlets; calyx puberulous, hardly half a line long, explanate-cup-shaped, truncate or nearly so; corolla glabrous, the throat bearded; drupes obovoid, about 2 lin. long, smooth, bluish black, the putamen longitudinally striate and slightly tubercled.

Hab.—In the tropical forests of Martaban, east of Tounghoo.—Fr. March-Apr.—SS.=Metam.

9. **P. lucidula,** Miq.—An evergreen scandent shrub, the young shoots more or less pubescent; leaves elliptically ovate to ovate-oblong, on a more or less pubescent petiole, 3 to 6 lin. long, rounded at the base, rather abruptly acuminate, 3-5 in. long, entire, chartaceous and rather glossy, more or less puberulous beneath; flowers small, greenish white, on very short puberulous pedicels, forming a sessile or very shortly peduncled, shortly pubescent, brachiate corymb at the end of the branchlets; calyx puberulous, $\frac{1}{2}$-1 lin. long, almost 2-lipped-cup-shaped, the upper lip 2- the lower broadly 3-toothed; drupes the size of a pepper-kernel, smooth, black, the putamen ribbed-tubercled.

Hab.—Tropical forests of the Andaman Islands; also Upper Tenasserim.—Fl. May.—s.—SS.=SiS.

10. **P. racemosa,** Wall.—An evergreen tree (25—30+(?)+2—3), the young shoots puberulous or pubescent; leaves elliptically lanceolate to elliptical and ovate-lanceolate, acute at the base, on a 4-10 lin. long petiole, acuminate, 3 to 5 in. long, entire or slightly serrate towards the apex, thick-membranous, glabrous; flowers small, greenish white, on short puberulous pedicels, clustered, forming a more or less interrupted, short-peduncled, pubescent spike-like panicle at the end of the branchlets; calyx puberulous,

about a line long; corolla glabrous; filaments pubescent at their insertion.

Hab.—Upper Tenasserim.

GMELINA, L.

Calyx cup-shaped, 4- or 5-toothed or sinuate-lobed. Corolla funnel-bell-shaped with an oblique 4-5-lobed limb, the lobes rather unequal, the 3 lower often larger and produced, the 2 upper ones often united in a 2-lobed upper lip. Stamens 4, didynamous, inserted at the inflated part of the tube, shorter than the corolla. Ovary 4-celled, with a solitary ovule in each cell laterally attached at or above the middle; style filiform, unequally 2-lobed. Fruit a fleshy drupe, the putamen hard or bony, 4- or rarely by abortion 2-celled. Seeds solitary in each cell, without albumen.—Trees or tall shrubs, sometimes scandent, with opposite simple leaves. Flowers usually showy, in cymes arranged in an irregular terminal panicle or sometimes almost reduced to a simple raceme, or racemose-panicled. Bracts small.

* *Bracts small and deciduous, green.*

Leaves glaucous beneath; corolla 2-lipped, the upper lip short, 2-lobed, straight . . . . . *G. arborea.*

Leaves villous-pubescent beneath; corolla 4-lobed, the lobes almost equal, the upper one reflexed . . . . . *G. Asiatica.*

* * *Bracts large and gaily coloured, densely imbricate.*

Spiny-armed; leaves glabrous; flowers large . . . . *G. Hystrix.*

1. **G. arborea,** Roxb.; Bedd. Sylv. Madr. 253; Brand. For. Fl. 364.—*Ya-ma-nay.*—A tree (50—60 + 12—30 + 6—12), leafless during H.S., the young parts more or less villous or velvety pubescent; bark brownish grey, about an inch thick, even, roughish from whitish corky pustules; cut greenish pale-coloured; leaves more or less ovate to almost cordate-ovate, acuminate or acute, on a 2-3 in. long petiole, 5-6 in. long by 4-5 broad towards the base, entire, firmly membranous to almost coriaceous, while young on both sides shortly yellowish pubescent, turning glabrous above and more or less so on the glaucous-green under-surface; flowers showy, on short yellowish puberous pedicels, in small short cymes forming a raceme-like minutely yellowish tomentose panicle at the end of the branches and above the axils of the fallen upper leaves; calyx densely tawny-tomentose, truncate-toothed; corolla brown, 5-lobed, the 2 upper lobes united in a very short 2-lobed straight upper lip, the 3 lower ones forming a 3-lobed lower lip with the centre lobe much larger and yellow-coloured; drupes obovoid or ovoid, fleshy, the size of a plum, smooth and glossy, yellow.

Hab.—Frequent all over Burma from Ava and Chittagong down to Tenasserim and the Andamans, especially in the upper mixed forests and also in the

tropical forests, but rarely entering alluvium, up to 3,000 ft. elevation.—Fl. March; Fr. Apr.-May.—l.—SS.=*Metam. SiS.* CaS., etc.

REMARKS.—Wood white, light, resembling mutchi wood. □′=35 pd. Used often for making canoes and boats, also for house-posts, planks, clogs, and for carving images. Recommended for furniture.

2. **G. Asiatica,** L.; Bedd. Sylv. Madr. 172; Brand. For. Fl. 365.—A leaf-shedding tree (25—30+3—6+1—3), with a very short trunk and very elongate spreading scandent branches often armed with opposite, straight, spine-like, abortive branchlets, the sotter parts villous-pubescent; leaves from elliptical to ovate and elliptically ovate, acute at the base, on a slender pubescent petiole ½-1 in. long, shortly acuminate, acute or bluntish, 2-3 in. long, firmly membranous, entire, villous-pubescent on both sides, glabrescent above; flowers showy, uniformly yellow, on short bracted pedicels, forming a rather short, bracted, densely pubescent raceme at the end of the branchlets or on short axillary shoots; bracts deciduous after flowering, leafy, lanceolate, pubescent; calyx about 3 lin. long, pubescent, truncate, minutely 4-toothed; corolla funnel-bell-shaped, 4-lobed, the lobes ovate-triangular, almost equal, the upper one reflexed; drupes globular or nearly so, the size of a cherry, smooth and glossy, yellow.

HAB.—Not unfrequent along choungs in the swamp forests of the Sittang valley and near Rangoon.—Fl. May.—s.—SS.=*All.* Lat. p.

3. **G. Hystrix,** Schult.—A large scandent shrub, the younger branchlets hispid-pubescent, armed with short, opposite, axillary spinescent branchlets; leaves obovate to elliptically oblong, on a slender glabrescent petiole ⅓-½ in. long, acute at the base, blunt or bluntish, 1½-2½ in. long, chartaceous, glabrous, or puberulous on the nerves beneath, above glossy, beneath opaque and glaucous, the nerves prominent on both sides; flowers large, yellow, sessile, protected by the large, broadly ovate, and rather acute veined and usually 5-nerved bracts of an inch length or longer which form an imbricate rather short spike at the end of the branches and branchlets; corolla about an inch long, puberulous outside, the tube slender, the lower lip of the 5-cleft limb oblong-lanceolate, much produced, acute; calyx sparingly appressed-pubescent, truncate-5-toothed; drupes (unripe) obliquely ovoid or obovoid, glabrous.

HAB.—Tenasserim; also adjoining parts of Siam.—Fl. H.S.

CLERODENDRON, L.

Calyx bell-shaped or rarely tubular, sometimes inflated, 5-toothed or -cleft, or rarely almost truncate, usually more or less enlarging in fruit. Corolla funnel- to salver-shaped, with a longer or shorter tube, the limb unequal and almost 2-lipped, 5-cleft. Stamens 4, nearly didynamous, inserted in the tube and long-

exserted. Ovary 4-celled, with a solitary ovule laterally attached at or above the middle of each cell; style filiform, shortly 2-lobed. Fruit a more or less succulent or almost dry drupe, containing 4 or by abortion fewer 1-celled pyrenes. Seeds solitary, erect.—Shrubs or undershrubs, rarely small trees, with opposite or whorled, simple or rarely lobed leaves. Flowers usually showy, in lax cymes or heads, usually collected into terminal corymbose or thyrsoid panicles, or rarely axillary.

* *Drupes dry, capsule-like, when fully ripe separating into 4 or fewer woody valve-like nuts. Corolla tubular-salver-shaped.*

Unarmed; leaves glabrous; calyx minutely toothed and truncate . *C. inerme.*

* * *Drupes sappy* 4- *or by abortion* 1-3-*lobed, the nuts quite smooth.*

× Calyx truncate, with 5 short teeth.

Panicle more or less leafy-bracted, more or less mealy puberulous; flowers blue; leaves glabrous, serrate . . . . *C. serratum.*

× × Calyx to the middle or lower down 5-lobed.

\+ Pubescent or tomentose.

Corolla-tube only as long as the calyx; panicle with small bracts only; leaves entire, softly pubescent-tomentose . . . *C. villosum.*

Corolla-tube 5-6 lin. long; panicle conspicuously and densely bracted; leaves serrate, appressed pubescent . . . *C. infortunatum.*

\+ \+ Quite glabrous.

Panicles terminal, nodding, elongate . . . . . *C. nutans.*

Panicles raceme-like, spreading, axillary . . . . . *C. gratum.*

1. **C. inerme,** Gaertn.; Bedd. Sylv. Madr. 174; Brand. For. Fl. 363.—An evergreen straggling shrub, 3 to 5 ft. high, the young shoots minutely puberulous; leaves variable, opposite or whorled in threes or fours, elliptical and obovate to ovate, linear-oblong and linear, blunt to acuminate, 1-3 in. long, thick and firmly membranous or coriaceous, entire, glabrous; flowers middling-sized, white, more or less rose-coloured on the outside, on 2-3 lin. long pedicels 2-bracted at the middle, by 3 or fewer or more, forming a peduncled, glabrous or puberulous cyme in the axils of the upper leaves; calyx-limb somewhat spreading, 5-toothed, glabrous; corolla-tube about an inch long, the lobes short, ovate, acute; filaments purplish; drupes dry, obovate, the size of a pea or larger, separating into 2 or 4 woody valves, at the base surrounded by the dry rather truncate calyx.

Var. 1, **genuina:** leaves usually opposite, shorter, obovate to elliptically oblong, more or less rounded or blunt, about 1-2 in. long.

Var. 2, **neriifolium** (*C. neriifolium,* Wall.): leaves opposite and often ternate, from linear to lanceolate, acute or bluntish, 2-4 in. long.

Hab.—Var. 1: common in the tidal jungles all along the coast of Burma from Chittagong down to Tenasserim and the Andamans; var. 2: more on rocky grounds and shallow alluvium of the Arracan and Tenasserim coasts.—Fl. Fr. ∞ -l.—SS.=All. *Sal.*

2. **C. serratum,** Spreng.; Brand. For. Fl. 364.—*Be-lya* or *bai-kyo.*—An evergreen large undershrub or sometimes a shrub, all parts glabrous or more usually the younger shoots mealy puberulous; leaves obovate-lanceolate to oblong and linear-oblong, acuminate or rounded at the base, on a very short petiole or occasionally almost sessile, acute, 4-10 in. long, membranous or thick-membranous, more or less coarsely serrate, glabrous or nearly so; flowers pale blue, middling-sized, on mealy puberulous pedicels 1-2 lin. long, forming an elongate, erect, more or less mealy puberulous and usually much bracted panicle at the end of the branchlets, the ramifications usually bluish white; bracts usually conspicuous and very numerous, more or less shortly pubescent, leafy, from ovate to lanceolate, acuminate, entire or serrate; calyx white, puberulous or mealy, truncate, toothed, about 2 lin. long or somewhat longer; corolla-tube curved, only about 3 lin. long, the lobes broadly obovate, much longer than the tube, the lower larger lip-like lobes sky-blue; stamens long-exserted, curved, bluish; drupes 1-4-lobed, sappy, bluish black and glossy, the size of a large pea.

Var. 2, **ornatum** (*C. ornatum,* Wall.): leaves broader and of thinner texture; panicles less mealy to almost glabrous, more lax, and the bracts less numerous and very deciduous.

Hab.—Rather frequent in the low forests all around the Pegu Yomah, also in Arracan and Ava.; var. 2: ascending into the upper mixed and mixed dry forests of Pegu and Promeup to 2,000 ft. elevation; rather rare in the Martaban hills.—Fl. July-Sept.; Fr. Jan.-Feb.

3. **C. infortunatum,** L.; Bedd. Sylv. Madr. 173, t. 22, f. 1; Brand. For. Fl. 363.—*Kha-oung-kyee.*—An evergreen shrub up to 10 ft. high, often growing out into a little tree up to 15 ft. high, all parts more or less pubescent; bark greenish grey, about an inch thick; cut greenish; leaves ovate to elliptically ovate, on a shortly appressed hispid petiole 1-3 in. long, rounded or sometimes cordate at the base, 6-12 in. long, repand-serrate, acute or acuminate, firmly membranous, above shortly and roughly pubescent, beneath more or less pubescent; flowers middling-sized, white, on 2-3 lin. long pubescent pedicels, forming an ample shortly and appressed-pubescent panicle at the end of the branches; lower bracts diminutively leaf-like, serrate; bractlets minute; calyx about 5 lin. long, shortly pubescent, green or purplish, the lobes lanceolate, acuminate; corolla minutely pubescent, the tube straight, somewhat longer than the calyx-lobes, the lobes oblong, as long or somewhat shorter than the tube; stamens exserted, bluish; drupes globular, or 1-4-lobed, sappy, bluish black, glossy, the size of a pea or larger.

Hab.—Common in the tropical and moister upper mixed forests up to 3,000 ft. elevation, all over Burma from Chittagong and Ava down to Tenasserim and

the Andamans, freely springing up in deserted hill toungyas and in the shade of village woods.—Fl. Feb.-March.—s×l.—SS.=∞.

Remarks.—Wood yellowish white, turning brownish, rather heavy, coarse-fibrous, rather loose-grained, soft, soon attacked by xylophages.

4. **C. villosum,** Bl.—An evergreen meagre shrub, often growing out into a little tree of 15 to 20 ft. height, all softer parts softly velvety-pubescent; leaves cordate, on a densely tomentose petiole ½-1½ in. long, acuminate, 4-6 in. long by 3-5 broad, entire, membranous, softly and densely velvety-pubescent on both sides; flowers rather small, white, on very short densely pubescent pedicels, forming a brachiate velvety-pubescent panicle at the end of the branches; lower bracts diminutively leaf-like, upper ones very deciduous; calyx softly greyish pubescent or velvety, about 4 lin. long, the lobes lanceolate, acuminate; corolla pubescent outside, the tube about as long as the calyx-lobes or somewhat longer or shorter, the lobes obovate-oblong, a little shorter than the teeth; stamens long-exserted; drupes globular, the size of a large pea (unripe green), very shining, supported by the enlarged velvety calyx.

Hab.—Not unfrequent in the drier hill forests of the Martaban hills, and there freely springing up in deserted upper toungyas, at elevations from 2,000 to 4,000 ft.—Fr. March.—l.

5. **C. nutans,** Wall.—A small shrub, all parts quite glabrous; leaves obovate- to linear-oblong, shortly petioled, acuminate at both ends, remotely repand-toothed, 3-7 in. long, membranous, glabrous; flowers white, rather showy, on capillary pedicels, cymose and forming a slender, elongate, nodding, glabrous panicle at the end of the branchlets; bracts subulate, minute; calyx ample, deeply cleft, glabrous, the lobes lanceolate; corolla glabrous, the tube very slender and at least twice the length of the calyx-lobes, somewhat curved; calyx in fruit stellately spreading, crimson; drupes globose, the size of a small cherry, glossy black.

Hab.—Ava, Kakhyen hills.—Fl. Oct.

6. **C. gratum,** Wall.—A small shrub, all parts glabrous or nearly so; leaves ovate to ovate-lanceolate, rounded or obtuse at the base, on a slender petiole 2-3 lin. long, acuminate, crenate, membranous, glabrous; flowers small, very shortly pedicelled or sessile, cymulose, the little cymes arranged into raceme-like one-sided horizontally spreading or recurved puberulous panicles in the axils of the leaves and much shorter than them; calyx puberulous, about a line long, the teeth subulate; corolla thrice the length of the calyx, pubescent outside; drupes globose, the size of a pepper-kernel.

Hab.—Ava, Kakhyen hills.—Fl. Fr. March.

VITEX, L.

Calyx more or less cup-shaped, 5-toothed or -lobed. Corolla almost 2-lobed-funnel-shaped, with a short tube, the limb unequally 5-lobed, the lower lobe usually much larger than the others and lip-like. Stamens 4, didynamous, inserted in the tube, ascending and exserted. Ovary 2- or more or less perfectly 4-celled, with a solitary ovule in each cell or half cell laterally attached at or about the middle; style filiform, shortly and acutely 2-lobed. Fruit a succulent drupe, the putamen separating into 4 (or by abortion fewer) hard, one-seeded pyrenes. Albumen none.—Trees or rarely shrubs, with opposite, digitately 3-7, rarely 1-foliolate leaves. Flowers usually small, in cymes, sometimes axillary, but usually collected into terminal panicles either simple and spike-like or branched. Bracts very small.

* *Flowers in panicles.*

○ Panicles terminal, without or only with minute subulate bracts.

All parts minutely white or greyish-mealy; leaves white, at least beneath; leaflets sessile; flowers sessile or nearly so . . *V. Agnus castus.*

As former, but the median leaflets petioluled; flowers smaller . *V. Negundo.*

All parts softly and shortly pubescent; flowers on slender pedicels; median leaflets petioluled . . . . . *V. canescens.*

Adult parts and leaves (at least above) all glabrous; leaflets petioluled . . . . . *V. heterophylla.*

Glabrous; corolla tomentose; calyx puberulous; leaflets coarsely crenate . . . . . *V. Wimberleyi.*

○○ Panicles terminal, with numerous conspicuous leafy bracts. All parts more or less pubescent; leaves digitately 3-foliolate; leaflets sessile.

Petiole not or only slightly and narrowly winged at the apex; panicle cymose-branched; flowers blue . . . . . *V. pubescens.*

Petiole broadly and leafy winged; panicle spike-like, interruptly cymose . . . . . *V. limonifolia.*

○○○ Panicles axillary, elongate, lax; leaves 3-foliolate; leaflets sessile, glabrous, the petiole winged or not . . . . . *V. alata.*

** *Flowers in axillary dichotomous cymes. Petiole not winged.*

All softer parts pubescent; cymes pubescent or tomentose, much shorter than the petiole . . . . . *V. vestita.*

All parts quite glabrous, at least when adult; cymes glabrous, repeatedly dichotomous, longer than the petiole . . . *V. leucoxylon.*

1. **V. Agnus castus,** L. (*V. trifolia,* L.; Bedd. Sylv. Madr. 172).—An evergreen shrub, small or large, or sometimes growing out into a little tree, the branchlets and shoots minutely white-mealy; leaves very variable, digitately 3-7- rarely 1-foliolate on the same or different plants, on a white-mealy petiole ½-1 in. long; leaflets from ovate and obovate to ovate-lanceolate and even linear, blunt, acute or acuminate, 1-3 in. long, entire to coarsely crenate-serrate and almost pinnatifid-cut, on both sides greyish or whitish mealy-

puberulous or above glabrescent or quite glabrous; flowers small, pale bluish or white, almost sessile or shortly pedicelled, in little cymes, forming a longer or shorter white or greyish mealy panicle in the axils of the uppermost leaves and at the end of the branchlets; calyx white-mealy, somewhat truncate, broadly 5-toothed, the 2 upper teeth approximated; corolla twice as long as the calyx, puberulous outside; drupes the size of a small pepper-kernel, bluish black, supported by the calyx.

Var. 1, **Agnus castus**: leaves usually 5-7-foliolate, the leaflets sessile or nearly so, more or less linear to linear-lanceolate, entire, acuminate; flowers nearly ½ in. long.

Var. 2, **trifolia** (*V. trifolia*, L.): leaves usually 3- or 1-foliolate on the same or separate individuals; leaflets broader and more or less obovate or oval, sessile or nearly so, acute or bluntish.

Hab.—Only var. 2: not unfrequent in the savannahs and savannah forests of the larger rivers, as Irrawaddi and Sittang.—Fl. Fr. C.S.—l.—SS.—All.

2. **V. canescens**, Kz.—A tree (25—35+10—12+1—3), shedding leaves in H.S., all softer parts shortly and softly greyish or yellowish pubescent; leaves digitately 3-5-foliolate, on a shortly tomentose petiole 1-2 in. long; leaflets usually shortly petioluled (the median ones usually on much longer petiolules), from ovate and ovate-lanceolate to elliptical and elliptically lanceolate, acuminate or acute, tapering at the base, 2-3 in. long, entire or rarely crenate-serrate, membranous, while young on both sides densely and softly short-pubescent, above turning roughish puberulous; flowers small, white, on slender 1-2 lin. long shortly tomentose pedicels, clustered and forming greyish or somewhat tawny short-tomentose compound or simple lax panicles above the scars of the fallen leaves and at the end of the branchlets; calyx greyish tomentose, about a line long, 5-toothed; corolla twice as long, tomentose outside; drupes obovoid, smooth, the size of a pea, supported by the more or less explanate calyx.

Hab.—Frequent in the open and dry forests of the Prome district.—Fl. Fr. March-Apr.—l.—SS.=Dil. *CaS.*

3. **V. heterophylla**, Roxb.—An evergreen tree (30—50 × 12—30+3—5), the young shoots puberulous; leaves digitately 5-3-foliolate, on a puberulous glabrescent petiole 1-2½ in. long; leaflets from oblong to obovate and elliptically lanceolate, obtuse or acute at the base, shortly and rather abruptly acuminate, the lateral ones on a 2-4 lin. long, the median ones on a much longer, petiolule, entire, thin-chartaceous, while young sparingly short-pubescent, turning glabrous; flowers rather small, yellowish, pedicelled or those in the forks sessile, in dichotomous, lax or crowded, longer or shorter peduncled cymes arranged into elongate, shortly puberulous

or almost velvety panicles in the axils of the uppermost leaves, and thus forming a more or less ample compound panicle at the end of the branchlets; calyx 1-2 lin. long, puberulous or velvety, shortly 5-toothed; corolla 2-4 lin. long, tomentose-velvety.

HAB.—Frequent in the tropical forests from Pegu and Martaban down to Tenasserim.—Fl. May-Aug.—s.—SS.=*Metam.* SiS.

4. **V. Wimberleyi,** Kz.—A small evergreen tree, much resembling *V. Sumatrana,* the young shoots puberulous; leaves digitately 5-3 foliolate, on a glabrous slender petiole 2-3 in. long; leaflets elliptically oblong to lanceolate, on slender glabrous petioles or the lowermost ones almost sessile and very small, acute at the unequal base, acuminate, coarsely crenate-serrate, chartaceous, glabrous, glossy; flowers small, sessile or nearly so, clustered or cymulose, forming puberulous loosely-bracted panicles at the end of the branches and in the axils of the upper leaves; bracts very deciduous, those at the base diminutively leaf-like, those higher up linear-oblong and passing into the linear-lanceolate, acute bractlets, which are about as long as the calyces; calyx velvety, truncate and broadly toothed, about 2 lin. deep; corolla pubescent outside, the tube short and wide, the lobes blunt, the lowermost much produced.

HAB.—Tropical forests of the Andamans.—Fl. R.S.

5. **V. pubescens,** Vhl.; Bedd. Sylv. Madr. 171.—*Kyek-yoh* or *kyet-yoh.*—An evergreen tree (30—40+12—20+3—4), the young shoots more or less tawny puberous-mealy; leaves digitately 3- or occasionally 4-foliolate, on a mealy-puberous $1\frac{1}{2}$-$2\frac{1}{2}$ in. long petiole not or only at the apex very slightly bordered; leaflets almost sessile, from ovate-oblong to elliptical and elliptically ovate, 3-5 in. long, more or less acute at the base, shortly acuminate to almost blunt, while young minutely pubescent, with the exception of the pubescent midrib glabrous or nearly so above; flowers small, blue, on very short pedicels or sessile, forming a rather compact much bracted, compound, mealy-puberulous panicle at the end of the branchlets; bracts numerous, leafy, shortly puberulous, ovate-lanceolate, bluntish or acute; bractlets conform, but smaller; calyx ample, about 3 lin. deep, mealy tomentose, sinuate-toothed; corolla 4-5 lin. long, scurfy-puberous outside, the lower large lobe dark blue; drupes bluish black, globular, the size of a pea, seated on the half-spherical tawny-tomentose calyx.

HAB.—Not unfrequent in the tropical and moister upper mixed forests from the southern parts of the Pegu Yomah and Martaban down to Tenasserim and the Andamans.—Fl. Jan.-March.—s: l.—SS.=Metam. SiS., etc.

6. **V. limonifolia,** Wall.—A leaf-shedding tree (30—50+10—20+3—4), the young shoots shortly tawny-pubescent or almost velvety; leaves digitately 3- occasionally 2-1-foliolate, on a leafy-

winged pubescent or villous petiole 2-3 in. long; leaflets obovate to elliptically ovate and broadly lanceolate, sessile or nearly so, acuminate at both ends, 3-4 in. long, entire, firmly membranous, minutely puberulous and sometimes somewhat scabrous above, shortly and softly tawny-pubescent beneath; flowers small, sessile or nearly so, in small, much bracted, compact cymes arranged in more or less interrupted spikes, forming a compound shortly tawny-tomentose panicle at the end of the branchlets; bracts conspicuous, more or less lanceolate, leafy, shortly velvety-pubescent, the bractlets smaller; calyx velvety-tomentose, about 1-1½ lin. long, 5-toothed; corolla velvety-tomentose outside, hardly twice as long as the calyx; drupes globular, the size of a small pea, bluish black, crowned by fulvous hairs, surrounded by the hemispherical ample pubescent calyx.

Hab.—Not unfrequent in the Eng and dry forests of the Prome district and Ava.—Fl. Fr. Sept.—l—SS.=CaS. Lat.

7. **V. alata,** Rottl. and Willd.—*Kyek-yoh.*—An evergreen tree (40—80+15—50+6—8), often shedding leaves in H.S., all parts glabrous, the very young shoots sparingly and minutely mealy; bark grey, rather smooth, about 2 lin. thick, peeling off in large curved flakes; leaves digitately 3-foliolate, on a slender glabrous petiole 2-3 in. long, and, especially in young plants, amply leafy-winged or quite wingless; leaflets sessile or on a very short petiolule, more or less lanceolate, acute at the base, 3-4 in. long, bluntish acuminate, entire, thin-membranous, glabrous; flowers rather small, white, with a golden throat and lip, on 1-3 lin. long, slender, minutely puberous pedicels, in small, peduncled, dichotomous, very lax cymes arranged in longer or shorter peduncled, glabrescent, slender, elongate panicles in the axils of the upper leaves; bracts minute, subulate; calyx hemispherical, 5-toothed, puberulous, only about a line long; corolla about twice as long, minutely tomentose outside; drupes globular, the size of a pepper-kernel, black, smooth, surrounded by the lax almost truncate calyx.

Hab.—Not unfrequent in the upper mixed and the tropical forests of Prome and Pegu, common in those of Martaban and Tenasserim, up to 2,000 ft. elevation.—Fl. March-Apl.—s: l.—SS.=*Metam.*, etc.

Remarks.—Wood yellowish or light-brown, clouded, close-grained, rather heavy, soft, but strong.—□'=45 pd. Used chiefly for wooden bells for cattle and handles.

8. **V. vestita,** Wall.—A tree, all softer parts shortly and softly pubescent; leaves digitately 3-foliolate, on a wingless densely pubescent petiole 2-3 in. long; leaflets on 2-3 lin. long pubescent petiolules (the median 1-1½ in. long), elliptically ovate to elliptically lanceolate, acuminate and often oblique at the base, 2-4 in.

long, acuminate, entire, membranous, above minutely puberulous, beneath softly and shortly glandular-pubescent; flowers small, on tomentose a line long pedicels, in short-peduncled, tawny-pubescent, stiff, dichotomous cymes, arising by 2-4 from the axils of the upper leaves and much shorter than the petiole; bracts minute, subulate; calyx about a line long or longer, broadly 5-toothed, puberulous; corolla about 2 lin. long, resinous-glandular outside; drupes supported by the truncate, 5-angular, spreading calyx.

HAB.—Ava.

9. **V. leucoxylon,** L. f.; Bedd. Sylv. Madr. 171.—*Htouksha.*—A tree (30—60 + 15—30 + 3—12), shedding leaves in H.S., all parts glabrous or the very young shoots minutely mealy; leaves digitately 5-3-foliolate, on a glabrous wingless petiole 2-4 in. long; leaflets on 3-10 lin. long or longer petiolules, obovate-elliptical to elliptically oblong, acute at the base, shortly and rather abruptly acuminate or apiculate, 2-5 in. long, entire, glabrous, when full-grown thin-coriaceous; flowers white, with a pale-lilac hue, on short glabrous pedicels or sessile, forming a lax, glabrous or obscurely puberulous, repeatedly dichotomous, long-peduncled cyme in the axils of the young leaves; calyx about 1-2 lin. long, minutely and obsoletely appressed-puberulous, broadly 5-toothed; corolla tomentose outside, the lower lip-like lobe very pale lilac and villous from the centre to the throat; drupes ovoid to obovate, the size of a cherry, black, smooth, supported by the circular, truncate, spreading calyx.

HAB.—Common all over Burma from Chittagong, Pegu, and Martaban down to Upper Tenasserim, in the savannah forests, but entering also the other mixed forests.—Fl. Apr.-May.—l.—SS.=*SiS.* All.

REMARKS.—Wood uniformly pale-greyish brown, rather heavy and close-grained, soft, durable, takes fine polish, the annual rings obsolete. W=□′=42; break-weight=142 pd. Used for cart-wheels and recommended for furniture.

CALLICARPA, L.

Calyx cup-shaped or rarely tubular, 4-5-toothed or -ribbed, and often angular. Corolla almost funnel- or bell-shaped, with a short tube, the limb equal, 4- or 5-cleft. Stamens 4, rarely 5, equal, inserted in the corolla-tube and somewhat exserted. Ovary 4-celled, each cell with a solitary ovule laterally attached at or above the middle; style filiform, with a dilated, truncate, or very shortly 2-lobed stigma. Fruit a small succulent drupe, containing 4 distinct 1-seeded nuts or pyrenes. Albumen none.—Shrubs or trees, rarely undershrubs, with simple opposite leaves. Flowers small, in axillary cymes. Bracts very small.

* *Leaves entire or nearly so.*
Tree; leaves mealy tomentose beneath . . . . . *C. arborea.*
* * *Leaves serrate; shrubs with 4-merous flowers.*
○ Leaves softly pubescent or floccose-tomentose beneath.
Petiole ½-1 in. long; drupes white . . . . . *C. macrophylla.*
Petiole only 2-3 lin. long . . . . . *C. rubella.*
○ ○ Young parts thinly mealy; leaves glabrous except the mealy nerves; leaves at both ends long acuminate . . . . . *C. longifolia.*

1. **C. arborea,** Roxb.; Brand. For. Fl. 368.—*Doung-hsap-pya.*—A leaf-shedding tree (25—35 + 10—15 + 3—4), all younger parts shortly greyish or yellowish mealy-tomentose; leaves elliptically to oblong-ovate and elliptically lanceolate, acute at the rounded base, on a mealy tomentose, 1-1½ in. long petiole, 5-8 in. long, bluntish acuminate, entire, coriaceous, while young on both sides mealy tomentose, afterwards more and more glabrescent above; flowers small, pale purple or lilac, almost sessile, forming dichotomous, mealy-tomentose cymes on a 1-2 in. long peduncle arising from the axils of the leaves; calyx about ½ lin. long, almost 4-toothed-truncate; corolla while in bud puberulous outside, afterwards glabrous, the limb 4-cleft; drupes globular, only about a line in diameter, smooth, lilac.

Hab.—Frequent in the upper mixed forests, entering the drier hill forests, of Martaban and Tenasserim; rather rare in Chittagong and Pegu; also Ava. Occurs also frequently in deserted hill toungyas up to 4,000 ft. elevation.—Fl. March.—l.—SS. = *Metam.*, etc.

Remarks.—Wood white, rather light and soft, loose-grained, takes good polish.

2. **C. macrophylla,** Vhl.; Brand. For. Fl. 368.—An evergreen shrub, 3 to 4 ft. high, all parts densely greyish tomentose from short stellate hairs; leaves lanceolate to oblong-lanceolate, more or less acute or rounded at the base, on a floccose-tomentose petiole ½-1 in. long, acuminate, 4-6 in. long, serrate or crenate-serrate, firmly membranous, while young on both sides stellate-tomentose, glabrescent above and wrinkled; flowers small, lilac, on slender pedicels, forming a rather dense dichotomous floccose-tomentose cyme on a short 4-6 lin. long peduncle arising from the axils of the leaves; calyx shortly tomentose, 4-toothed, hardly ½ lin. long; corolla glabrous, the limb 4-cleft; drupes globular, about a line in diameter, smooth, white.

Hab.—Ava.

3. **C. rubella,** Lindl.—An evergreen shrub, 4-6 ft. high, the younger parts densely stellate-pubescent; leaves linear-oblong, somewhat narrowed towards the rounded base, on a tomentose petiole 2-3 lin. long, acuminate, 3-5 in. long, serrate, membranous, shortly but densely puberulous above, beneath softly pubescent

from short stellate hairs; flowers small, purplish, on rather slender pubescent pedicels, forming a small dichotomous pubescent cyme on a 4-6 lin. long slender peduncle arising from the axils of the leaves; calyx puberulous, about ½ lin. long, shortly 4-toothed; corolla slightly and minutely pubescent outside, the limb 4-cleft; drupes globular, the size of a pepper-kernel or smaller, sappy, smooth.

HAB.—Martaban hills.

4. **C. longifolia,** Lamk.—An evergreen shrub, 5-6 ft. high, all younger parts mealy-puberulous; leaves lanceolate to broadly lanceolate, tapering into a slender mealy-puberulous petiole 4-6 lin. long, 3-4 in. long, acuminate, serrate, membranous, while young thinly mealy-puberulous, afterwards glabrescent except on the stronger nerves; flowers small, purplish, on very short pedicels, forming a short mealy or almost scaly dichotomous cyme on a 3-5 lin. long axillary peduncle; calyx glabrous or nearly so, indistinctly 4-toothed; corolla glabrous, the limb 4-cleft; drupes depressed-globular, on slender pedicels, about a line thick, glabrous, snow-white.

HAB.—Apparently not unfrequent from Martaban down to Tenasserim.—Fl. March.

AVICENNIA, L.

Calyx divided to the base into 5 distinct segments or sepals. Corolla-tube short and ample, the limb 4- (actually 5-) -lobed, the lobes nearly equal or the upper lobe usually broader and more or less distinctly notched. Stamens 4, didynamous, inserted in the throat, slightly exserted. Ovary 1-celled, with 4 ovules collaterally suspended from a central projectingly 4-angular column dividing the ovary into 4 cells. Fruit a compressed capsule, the pericarp opening in 2 valves. Seed solitary, erect, without integuments (the integuments of the ovule not developed). Embryo with 2 very large cotyledons folded longitudinally; radicle very hairy; plumule prominent, germinating before the fruit drops off, as in mangroves. —Trees or shrubs, with opposite, simple, leathery leaves. Flowers in small cymes or clusters, axillary or in terminal panicles.

Leaves usually lanceolate and indistinctly white-tomentose beneath; flowers shortly spiked; calyx-lobes 1 lin. long; style very short . . . . . *A. officinalis.*

Leaves more or less obovate and usually indistinctly tawny-tomentose beneath; flowers in heads; calyx-lobes 2 lin. long; style long and slender . . . . . *A. tomentosa.*

1. **A. officinalis,** L.; Bedd. Sylv. Madr. 174, t. 22, f. 2; Brand. For. Fl. 371.—*Thamè.*—An evergreen tree (25—40+10—15+3—4), the young shoots more or less whitish from an

indistinct adnate tomentum; leaves variable, from lanceolate to obovate, acuminate or acute at the base and tapering into a whitish 3-5 lin. long petiole, acuminate or bluntish to rounded at the apex, 1½-3 in. long, coriaceous, entire, glabrous and glossy above, beneath covered with a silvery white, appressed, indistinct tomentum; flowers pale ochre-yellow, very small, sessile, forming short almost distichous spikes arranged into a short, brachiate, silvery white panicle at the end of the branches and in the axils of the leaves; calyx about a line long or somewhat longer, the lobes rounded, glabrous or silky pubescent, ciliate or not; corolla almost rotate, as long as the calyx, the tube glabrous and hardly ¼-½ lin. long, the lobes a line long, appressed silky-pubescent outside; ovary pubescent; style very short; capsules ovate-compressed, indistinctly silvery-tomentose, transversely wrinkled, acuminate; radicle of seed long, furnished with a thick brush just below the conical apex.

Hab.—Frequent in the tidal forests all along the coast of Burma from Chittagong down to Tenasserim and the Andamans.—Fl. begin. of R.S.—l.—SS.= Sal.

2. **A. tomentosa,** Roxb.—An evergreen tree (20—35 + 10—15 + 3—4), the young shoots covered with a minute, adnate, tawny or pale-coloured, rarely greyish, tomentum, or sometimes minutely and densely puberulous; leaves from obovate and elliptical to obovate-oblong, tapering into a strong 3-4 lin. long often minutely mealy petiole, rounded or blunt at the apex, 1-3 in. long, firmly coriaceous, entire, glabrous and glossy above, beneath covered with a minute indistinct brownish or rarely greyish tomentum or minutely pubescent; flowers pale ochre-coloured, middling-sized, sessile, in peduncled indistinctly tawny-tomentose heads, solitary or more usually forming a terminal or axillary peduncled panicle; calyx about 2 lin. long or somewhat longer, glabrous or silky-pubescent, the lobes ciliate; corolla-tube very short, hardly ½ a line long, the lobes silky-pubescent outside, 2 lin. long or somewhat longer; ovary villous; style long and slender; capsules almond-shaped, the size of a small plum, compressed, marked by the scar of the fallen style, tawny velvety-tomentose; radicle densely villous.

Hab.—Frequent in the tidal forests all along the coast of Burma, from Chittagong down to Tenasserim.—Fl. begin. of R.S.—l.—SS.=Sal.

LABIATÆ.

Flowers irregular, very rarely almost regular. Calyx persistent, 2-lipped or 5-toothed. Corolla more or less 2-lipped or rarely nearly equally 4-5-lobed, imbricate in the bud. Stamens 2 or 4, in pairs, inserted in the tube of the corolla and alternating with its lower lobes. Anthers either 2-celled or 1-celled by abortion or by

amalgamation of the 2 cells. Ovary 4-lobed and -celled, with a solitary erect ovule in each cell; style simple, 2-lobed, arising from the centre of the ovary. Fruit of 4 small 1-seeded nuts enclosed in the calyx. Albumen none. Embryo straight or slightly incurved, the radicle inferior; cotyledons thick.—Herbs or shrubs, very rarely small trees, glandular-dotted and aromatic, the branches usually 4-cornered. Leaves opposite or whorled, simple or divided. Stipules none. Flowers in clusters or half-whorls, or solitary, forming often racemes, cymes or panicles.

* *Stamens straight or diverging; corolla-tube hardly longer than the calyx-tube, the limb almost equally* 4-5-*cleft.*

Anthers 2-celled, the cells parallel; fruiting calyx pappose, adhering to the achenes . . . . . *Colebrookia.*

* * *Stamens ascending, didynamous; corolla* 2-*lipped; calyx veined,* 5-10-*nerved.*

Stamens exserted; achenes at the apex long-membranously produced . . . . . *Colquhounia.*

COLEBROOKIA, Sm.

Calyx bell-shaped, equal, 5-parted, feathery, turning pappose in fruit, adhering to the achenes. Corolla as long as the calyx-tube, the limb very short, almost equal, 5-cleft, the upper lobe notched. Anthers 4, distant, almost sessile, parallely 2-celled. Disk glandless. Style deeply 2-cleft, the lobes subulate.—Tomentose shrubs or undershrubs.

1. **C. oppositifolia,** Sm.—A large shrub or shrubby undershrub, all softer parts more or less greyish tomentose; leaves opposite, lanceolate to linear- and oblong-lanceolate, acute or somewhat rounded at the base, on a densely pubescent petiole $\frac{1}{2}$-$\frac{3}{4}$ in. long, long-acuminate, 5-7 in. long, crenulate, thick-membranous, above shortly puberulous and green, beneath more or less greyish tomentose; flowers minute, in dense 1-3 in. long sessile spikes collected into a terminal tomentose panicle furnished with a pair of floral leaves at the base; calyx-tube very short, the teeth subulate, elongating in fruit and becoming elegantly feathery; corolla tubular, contracted at the middle, the limb-lobes ovate, very short; style exserted; achenes oblong, almost triquetrous, villous at the apex.

Hab.—Ava, Kakhyen hills; Tenasserim.—Fr. March.

COLQUHOUNIA, Wall.

Calyx tubular-bell-shaped, 10-nerved, almost curved and almost equally 5-toothed, naked at the throat. Corolla 2-lipped, the upper lip erect, entire, the lower almost spreading and 3-lobed, the tube exserted and incurved. Stamens 4, ascending, didynamous,

the lower ones shorter; anthers 2-celled, the cells afterwards divaricate. Style unequally 2-cleft, the lobes subulate. Achenes oblong, dry, smooth, at the apex membranously produced.—Scandent or straggling shrubs, often tomentose. Flowers crimson or dull-purple, in lax axillary half-whorls or rarely crowded into a terminal spike. Bracts minute.

1. **C. elegans,** Wall.—A scandent or half-scandent shrub, all softer parts pilose-pubescent; leaves ovate, shortly petioled, rounded or obtuse at the base, acuminate or acute, 1½-2½ in. long, crenate-serrate, membranous, pubescent on both sides (more so beneath); flowers middling-sized, orange-coloured, crimson-dotted, very shortly pedicelled, fascicled in the axils of the leaves or as often the half-whorls crowded and terminating axillary branchlets and appearing spiked; calyx pilose-pubescent, about 3 lin. deep, the lobes subulate, about 2 lin. long; corolla curved, about ½ in. long, pubescent outside.

Hab.—Frequent in the damp hill forests of Martaban, at 4,000 to 5,000 ft. elevation; Ava, Kakhyen hills.—Fl. Fr. March.—s.—SS.=Metam.

NYCTAGINEÆ.

Perianth simple, inferior, the lower portion persistent and enclosing the ovary and fruit, the upper portion variously shaped, with 5, rarely 4, angles, folds, teeth or lobes deciduous or withering. Stamens 4 or 5 or fewer or rarely more (up to 20), inserted on, or united at the base with, a narrow or cup-shaped disk more or less adnate to the stalk of the ovary; filaments slender, often exserted; anthers 2-celled, the cell attached back to back and opening longitudinally round the outer margin. Ovary shortly stalked, 1-celled, with a solitary erect ovule; style terminal, simple. Fruit 1-seeded, enclosed in the persistent, tough or hardened base of the pericarp-like perianth, the real pericarp thin and membranous, more or less adherent to the thin testa of the seed. Embryo curved, transversely folded or longitudinally convolute around or within a mealy albumen; radicle inferior.—Herbs, shrubs or trees with often thickened-jointed branches. Leaves usually opposite, rarely alternate, simple. Flowers solitary or in clusters or umbels, the bracts sometimes forming a coloured involucre, or small and deciduous.

A small order with about 6 species indigenous in Burma, of which 3 only are trees. Some species, like *Mirabilis,* possess purgative qualities in their root.

PISONIA, Plum.

Perianth in hermaphrodite flowers contracted above the ovary, in the males bell-shaped and in the females ovoid or cylindrical, the

limb in all 5-angular or 5-toothed. Stamens 6-8, rarely 10, longer than the perianth, rudimentary in the females. Ovary rudimentary or none in the males, in the females and hermaphrodites elongate, with a dilated oblique stigma often fringed. Fruiting perianth oblong, club-shaped or elongate, ribbed or even and often very sticky, dry, indehiscent. Seed solitary. Albumen scanty. Embryo straight, the cotyledons convolute over the intruded testa.—Trees or shrubs, sometimes scandent, with opposite or scattered leaves. Flowers small, hermaphrodite or more usually unisexual by abortion, in cymes often arranged in terminal panicles. Bractlets 3-1, minute.

* *Fruits with a double or simple row of prickles along the 5 corners.*

Leaves 1-3 in. long, bluntish; prickles of fruit in a double row, short, glandular-headed; scandent shrub . . . . *P. aculeata.*

Leaves 7-10 in. long; prickles in a single row, short and irregular, acute; tree . . . . . *P. alba.*

* * *Fruits unarmed, with a broad, blackish, sticky line along the 5 bluntish corners; tree, leaves acuminate* . *P. umbellifera.*

1. **P. aculeata,** L.; Bedd. Sylv. Madr. 175. t. 22. f. 3.—A large straggling scandent shrub, usually armed with recurved sharp thorns (abortive peduncles), all parts glabrous or shortly pubescent; leaves opposite or occasionally alternating, ovate to ovate-oblong or lanceolate, on a slender glabrous or puberulous petiole 3-4 lin. long, 1-3 in. long, blunt or bluntish acuminate, thick membranous, glabrous or shortly pubescent; flowers small, greenish, dioecious, in small dense tawny-puberulous or tomentose cymes or clusters, often collected in a sort of umbel or in small panicles at the end of the branchlets; perianth tawny-pubescent, the males bell-shaped and shortly pedicelled, the fertile ones nearly sessile, ovoid, about a line long, enclosing the ovary; stigma deeply lobed or fringed; fruits on long stiff shortly puberulous peduncles, often in divaricate large cymose panicles, linear-club-shaped to obovate, 6-7 lin. long, truncate, obsoletely 5- ribbed, the ribs marked with stiff glandular-headed short very sticky prickles arranged in a double series.

Hab.—Along the sea-shores, especially in beach jungles, of Tenasserim and Andamans.—Fr.-Apr.

2. **P. alba,** Span.—An evergreen tree (30—40 + 15—20 + 2—4), all parts glabrous or the young shoots minutely puberulous; leaves ovate-oblong to oblong, 6-10 in. long, usually unequal and obtuse at the base, on a $\frac{1}{2}$-$1\frac{1}{3}$ in. long petiole, shortly acuminate to acute and blunt, thick-membranous, glabrous or minutely puberulous in the axils of the nerves; flowers dioecious, in peduncled rather large puberulous cymes; perianth about $1\frac{1}{2}$ lin. long, funnel-shaped, greyish puberulous; fruits in squarrose stiff puberulous or glabrous

panicles, similar to those of the former, linear-club-shaped, about ½ in. long, truncate, 5-cornered, the corners with a single row of sharp and a little recurved acute prickles.

Hab.—In the beach forests of the Andamans, rare. Fr. Apr.—s.—SS.= Aren.

3. **P. umbellifera,** Seem.—An evergreen tree (30—50+15—20+4—9), all parts glabrous, or the young shoots obsoletely puberulous; leaves ½-1 ft. long, oblong-lanceolate to oblong, acuminate at both ends, on a ½-1 in. long petiole, entire, thick-membranous, glabrous and glossy; flowers dioecious, small, in small cymes or occasionally umbellets, forming often a cymose panicle, the peduncle sparingly tawny-tomentose and glabrescent; perianth glabrous or nearly so; fruits elongate, truncate at the apex, up to 1½ in. long, glabrous, 5-cornered, the corners smooth and lined with a broad stripe of a blackish very tenacious and viscose matter.

Hab.—Not unfrequent in the tropical forests along the coast of the Andamans.—Fr. Apr.—s.—SS.=SiS.

PHYTOLACCACEÆ.

Perianth of 5 rarely 4 divisions or lobes, either all herbaceous or scarious or petal-like on the margins or coloured inside, imbricate. Staminodes (or petals?) 5 or fewer, minute and stalked, or rarely petal-like. Stamens as many as perianth-lobes and alternating with them, or numerous, inserted on the torus or at the base of the perianth; anthers 2-celled, the cells parallel and dehiscing longitudinally. Ovary either of a single somewhat excentrical carpel, or of several carpels either distinct or united in a ring round the centre of the torus, or forming a single 1-celled ovary with the ovules in a ring round a central column; ovules solitary in each cell, ascending, amphitropous or anatropous; styles as many as carpels, free or united at the base, stigmatic along their inner edge. Ripe carpels variously enlarged, free or united, dry or succulent, indehiscent or dehiscent. Seeds sometimes with a small arillus or strophiole. Albumen mealy or somewhat fleshy, more or less copious, or none. Embryo usually much curved, rarely folded or straight, the cotyledons narrow or broad and convolute; radicle inferior.—Herbs or undershrubs, rarely shrubs or trees, with alternate or rarely almost opposite simple leaves. Flowers hermaphrodite or unisexual, rarely solitary, usually in spikes, racemes or clusters. Bracts and bractlets usually present.

A small order represented in Burma only by the undermentioned species. Acrid principles prevail, but besides possessing some medicinal and poisonous properties the species are of no importance to foresters.

CORIARIA, L.

Perianth 5-6-sepalled, imbricate. Staminodes 5 or 6, sepal-like. Stamens 10 or 12, exserted; filaments filiform; anthers large, 2-celled. Ovary consisting of 5 or 6 carpels adnate to a central torus, with a solitary pendulous ovule in each; styles as many, subulate, simple. Ripe carpels dry, dehiscent. Embryo straight.—Shrubs or small trees, with opposite or almost opposite leaves. Flowers in spikes.

1. **C. Napalensis**, Wall.—A large shrub, growing out into a little tree of 12-16 ft. height, with 4-cornered branches, all parts glabrous; leaves elliptical to elliptically ovate, almost sessile, shortly and rather abruptly acuminate, 1½-2 in. long, thin-coriaceous, 3-nerved at the base, glabrous; flowers small, greenish, with large purple anthers, on about 2 lin. long pedicels and forming 1-1½ in. long, glabrous racemes arising in small clusters from above the scars of the fallen leaves on the older branches; sepals and staminodes about a line long, almost conform, rotundate; ripe carpels dry, compressed, dehiscent, about a line long.

Hab.—Ava, Kakhyen hills.—Fr. May.

MYRISTICACEÆ.

Flowers regular, dioecious. Perianth deciduous, 3- (rarely 2- or 4-) -lobed, the lobes valvate in bud. Male flowers: stamens united in a central column; anthers 3, 6 or more, adnate to the column at the apex, or in a ring immediately below the column, 2-celled, the cells parallel, opening longitudinally. Female flowers: ovary free within the perianth, with a single, erect, anatropous ovule; stigma sessile or nearly so, capitate or depressed. Fruit thick- or fleshy-coriaceous, opening tardily in 2 valves. Seed erect, sessile, more or less covered with an entire or more usually lobed or jagged coloured arillus. Albumen ruminate. Embryo very small, basilar, with divaricate cotyledons.—Trees, rarely shrubs, with alternate, simple, usually dotted penninerved leaves. Stipules none. Flowers small, the males more numerous than the females, in axillary or supra-axillary racemes or panicles. Bracts minute or none.

An order consisting of a single genus, of which 5 species occur in Burma. The nutmeg and its mace (*Myristica fragrans*) is the produce of this family. Aromatic qualities prevail, while their bark abounds in an acrid juice, which is viscid and stains red.

MYRISTICA, L.

Characters same as of the order.

* *Anthers linear, adnate to the whole back of the cylindrical or spindle-shaped staminal column; flowers in simple racemes; arillus lacerate and lobed.*

Fruits up to an inch long, glabrous; flowers glabrous, on slender 3-4 lin. long pedicels . . . . . *M. fragrans.*

Fruits 2 in. long or longer, glabrous; flowers rusty-scurfy, on 1-2 lin. long pedicels . . . . . *M. elliptica.*

** *Staminal column pear-shaped or globular, covered all over, or only along the depressed apex, with anthers; perianth globular or nearly so, 2-3-cleft; flowers minute, in larger or smaller compound panicles; arillus nearly complete and entire.*

Fruits globular, the size of a cherry; inflorescence rusty-scurfy-tomentose . . . . . *M. Irya.*

Fruits oblong, the size of a prune; inflorescence, etc., glabrous or nearly so . . . . . *M. amygdalina.*

*** *Staminal column club-shaped, at the apex dilated into a concave or convex disk around which the anthers are attached; female perianth globular, male one turbinate, often lengthened in a stalk. Flowers clustered or almost umbellate on axillary tubercle-like or elongate thick peduncles; arillus lacerate or lobed.*

Leaves large, often 1-1¼ ft. long; petioles thick, scurfy-tomentose; fruits tomentose, nearly 2 in. long . . . . *M. longifolia.*

Leaves up to 7-9 in. long; petiole ½ an in. long, rather slender, glabrescent; fruits glabrescent, only an inch long . . . *M. corticosa.*

1. **M. elliptica,** Wall.—An evergreen tree (25—30+8—12+3—4), glabrous, the leaf-buds tawny-lepidote; leaves 1-1½ ft. long, obovate-oblong to oblong-lanceolate, acute at both ends, on a ⅓-½ in. long strong petiole, coriaceous, glabrous, almost silvery pale-coloured beneath, the lateral nerves rather distant, acutely prominent; flowers rusty-scurfy-tomentose, on 1-2 lin. long scurfy-tomentose pedicels forming a short-peduncled few-flowered fascicle above the axils of the leaves; fruits elliptically oblong, 2 in. long or somewhat longer, glabrous, the seed with a uniform brown glossy testa, covered with a deeply lacerate blood-red arillus.

Hab.—Frequent in the tropical forests of South Andaman.—Fr. Febr.—s.—SS.=SiS., etc.

2. **M. Irya,** Gaertn.; Bedd. For. Fl. 176.—An evergreen tree (30—40+(?)+2—3), the young shoots covered with a rusty-coloured fugaceous-scurfy tomentum; leaves lanceolate to oblong-lanceolate, acute or narrowed at the base, on a glabrescent petiole 4-5 lin. long, ½-1 ft. long, acuminate, thin-coriaceous, entire, glabrous or while young fugaceous-scurfy along the midrib, the nerves rather thin, about 15-20 at each side, curved; flowers small, yellowish, forming shorter or longer rusty-tomentose compound panicles arising from above the scars of the fallen leaves; perianth of females globular, 2-3-lobed, that of the males turbinate; staminal column pear-shaped, with a concave apex covered with anthers;

fruits globular or nearly so, the size of a cherry, the seed covered with a complete thin orange-yellow arillus.

Hab.—Frequent in the tropical forests of Tenasserim and the Andamans.—Fl. H.S.; Fr. R.S.—s.—SS.=Metam.

3. **M. amygdalina,** Wall.—An evergreen tree (40—50+(?)+2—4), quite glabrous or the young shoots thinly covered with a fugaceous-scurfy tomentum; bark greyish brown, 2-3 lin. thick, lengthwise fissured; cut brown, exuding a clear resin turning red at exposure; leaves from oblong and elongate-oblong to obovate-oblong, on a tolerably slender glabrous petiole 8-9 lin. long, a little decurrent at the acute base, shortly and rather bluntish acuminate, thin-coriaceous, glabrous, the nerves thin, about 15-19 at each side, somewhat irregular; flowers small, yellowish, shortly pedicelled, forming a shorter or longer compound glabrous or slightly tomentose yellowish panicle arising usually from above the axils of the fallen leaves; perianth globular, hardly a line long, 3-cleft, glabrous; staminal column globular, shortly pedicelled, covered all over with anthers; fruits about $1\frac{1}{2}$ in. long, oblong, glabrous, the seed with a uniformly pale-coloured testa, covered with an almost complete orange-yellow fleshy aril.

Hab.—Not unfrequent in the tropical forests from Martaban down to Tenasserim and the Andamans, also on the southern spur of the Pegu Yomah above Rangoon.—Fl. Febr.—Apr.; Fr Apr. May.—s.—SS.=Lat. p.; *Metam.* SiS.

Remarks.—Wood white, coarsely fibrous, light, very perishable, soon attacked by xylophages.

4. **M. longifolia,** Wall.—*Za-deip-hpo.*—An evergreen tree (60—70+25—30+4—5), the younger parts tawny scurfy-tomentose; bark $\frac{1}{4}$ in. thick, longitudinally lined, peeling off in little polished angular pieces; cut red, exuding a red resin; leaves large, oblong-lanceolate, almost cordate or rounded at the base, 1-$1\frac{1}{4}$ ft. long, acuminate, on a very thick scurfy-tomentose petiole only 4-6 lin. long, entire, coriaceous, while young covered with a very fugaceous tawny tomentum, soon turning glabrous, beneath glaucous or pale-coloured, the 20-30 nerves at each side strong, approximate, parallel; flowers middling-sized, rusty-scurfy-tomentose, on short curved pedicels, several together forming rather poor clusters of the length of, or longer than, the petiole and arising from axillary thick tubercles; male perianth turbinate-globose, stalk-like narrowed towards the base, 3-lobed, the lobes broadly trigonous; staminal column club-shaped, at the apex dilated in a depressed disk, around which the anthers are attached; fruits oblong, the size of a pigeon's egg, rusty-tomentose; aril thin and lobed.

Hab.—Frequent in the tropical forests from Chittagong, Pegu, and Martaban down to Tenasserim, especially along choungs.—Fl. March-Apr.—s.—SS.=SiS. Metam.

Remarks.—Wood whitish, turning pale brown, rather heavy, fibrous, soon attacked by xylophages. Exudes red resin.

5. **M. corticosa,** H.f. & Th.; Bedd. For. Fl. 271.—An evergreen tree (40—50 + (?) + 3—4), the trunk somewhat fluted and dark grey, the young parts covered with a fugaceous, thin, tawny tomentum; bark about 2-3 lin. thick, grey, even, peeling off in thin irregular flakes; cut red, exuding a red resin; leaves elongate-elliptical to lanceolate and narrow-lanceolate, acute at both ends or shortly and bluntish acuminate, 7-9 in. long, on a glabrous strong petiole about ½ in. long, entire, coriaceous, glabrous, glaucous beneath, the nerves strong but thin, about 16-20, rather parallel; flowers small, orange-yellow inside, shortly tawny or rusty-tomentose outside, on short, thick, velvety pedicels, forming a rather poor tawny or rusty-velvety cluster on the short, thick, bracted peduncles arising from above the axils of the leaves; perianth of males narrowed into a stalk, that of the females almost bell-shaped, the lobes triangular-ovate; staminal column almost club-shaped, with the anthers attached round the margin of the dilated, flat, apical disk; ovary rusty villous; fruits ellipsoid, covered with a fugaceous thin tomentum and soon glabrescent, about an inch long, the arillus blood-red, somewhat fleshy and lacerate.

Hab.—Not unfrequent in the tropical forests from Chittagong and the Pegu hills down to Tenasserim and the Andamans.—Fl. Feb.-March; Fr. March-Apr.—s.—SS. = SiS. Metam.

Remarks.—Wood brown or red, rather light, coarsely fibrous, rather close-grained, soon attacked by xylophages. Yields red resin.

LAURINEÆ.

Perianth regular, the tube very short or none at the time of flowering, sometimes enlarged over or under the fruit, or rarely adnate to the ovary and fruit; segments 6, or rarely fewer, imbricate. Stamens normally twice as many as perianth-segments, but sometimes reduced to 3 or irregularly increased in number, all fertile or a certain number reduced to staminodes or sessile or stalked glands; anthers adnate, with 2 collateral or superposed pairs of cells, each cell opening in a valve from the base upwards or (in *Hernandia*) from the inner to the outer side. Ovary free, or (in *Hernandia*) adnate, 1-celled, with a solitary ovule suspended from the apex of the cavity from a funicle adnate to its side, or rarely with a second abortive ovule; style simple, often very short; stigma capitate or dilated, entire or lobed. Fruit a berry or drupe, rarely dry or nearly so, the perianth entirely deci-

duous or the tube enlarged and dry or fleshy, supporting or enclosing the fruit. Seed pendulous, without albumen. Embryo with thick fleshy cotyledons filling the seed and enclosing the plumule and short superior radicle.—Trees or shrubs, with usually alternate simple leaves, rarely leafless twiners. Stipules none. Flowers usually small, the inflorescence various.

A large order of considerable importance to the forester. All species are more or less aromatic and fragrant, and cinnamom, cassia, and the true sassafras are the produce of trees of this order. Camphor is produced by several species of laurels, but chiefly from *Camphora officinarum*, and benzoin is produced also by a few trees growing in Burma. The seeds of some yield good oil, while the fruits of a few have found their way to our tables, like the avocado pear (*Persea gratissima*). It is, however, chiefly the timber which interest the forester most. The Borneon iron-wood (*Eusideroxylon Zwageri*) is probably the heaviest and hardest wood known; pieces of this falling on the ground sound like iron, and the timber is said to be as durable too; white ants or teredo do not attack it. The well-known greenheart of Demerara comes from *Nectandra Rodiaei;* sweet-wood of Jamaica comes from *Oreodaphne exaltata*. Most of the species grow in the tropical forests, and hence it seems that so little is as yet known of the quality of the wood of Indian laurels. There are about 50 species known from Burma.

* *Anther-cell opening by upwards-turning valves.*

\+ Flowers in naked inflorescences, not surrounded by a proper involucre or imbricate bracts.

× Anthers 4-locellate; fruit superior and free, not enclosed in the pericarp.

Perianth-segments breaking off at their middle, leaving a persistent 6-lobed cup or disk under the fruit . . . . . *Cinnamomum.*

Perianth wholly persistent and indurating, the segments erect and appressed to the fruit, resting on a more or less thickened pedicel . . . . . *Phoebe.*

Perianth wholly persistent, not indurating, the segments in fruit reflexed or spreading; pedicel usually not thickened . . *Machilus.*

Perianth nearly wholly deciduous, the fruit (large) resting on the thickened often fleshy pedicel . . . . . *Alseodaphne.*

×× Anthers 2-celled.

† Fruit superior and quite free, not adnate.

Perianth wholly deciduous, the segments nearly equal, or (in Haasia) the outer lobes minute; ovary 1- or imperfectly 2-celled; berry resting on a thickened often fleshy pedicel . *Beilschmiedia.*

†† Fruit wholly enclosed in the enlarged perianth, but rarely adnate to it, only the apex sometimes exserted.

Fertile stamens 9, free. Fruits free, not adnate to the perianth; flowers in racemes or panicles . . . . . *Cryptocarya.*

Fertile stamens only 3, free, the 6 outer stamens reduced to glands or to a glandular ring; fruit enclosed in the truncate perianth-tube; flowers in panicles . . . . *Endiandra.*

++ Flowers in umbels or clusters, either surrounded by a 4- to 6-leaved persistent or more or less deciduous involucre or covered by several rows of imbricate bracts and, while in bud, entirely enclosed by them.

○ Flowers in longer or shorter peduncled umbels, subtended by a 4 to 6-phyllous involucre.

× Anthers 4-locellate.

Perianth 6-cleft or truncate; fertile stamens 9-12, rarely 15-30, the inner 3-6 bearing glands at base; fruit resting on a flat or concave often large and thick cup, or half-immersed in the same . . . . . *Tetranthera.*

× × Anthers 2-locellate.

Perianth 4-6-cleft, deciduous; fertile stamens 6-9, the inner 2-6 bearing glands at base; fruit resting on a small entire or 6-cleft disk; usually aromatic trees . . . . . *Lindera.*

○ ○ Flowers in bud enclosed in an imbricate-scaled globular sessile bud, after expansion surrounded by several rows of imbricate bracts.

× Anthers 4-locellate.

Flowers solitary; perianth 6-9-cleft . . . . . *Dodecadenia.*

Flowers several together; perianth 4-6-cleft, the segments deciduous; stamens 4, 6 or 9, the innermost ones 2-glanded at base; berry seated on the more or less thickened pedicel or perianth-base . . . . . *Litsaea.*

× × Anthers 2-locellate.

Flowers several together; perianth 6-9-cleft with the segments deciduous; stamens 9, rarely more, the 3 innermost ones 2-glanded at base; berry seated on the entire or 6-lobed perianth-base of the more or less thickened pedicel . . . . *Daphnidium.*

∗ ∗ *Anthers opening laterally, the valves separating laterally from the inner to the outer edge.*

Flowers monoecious, the females with an involucel enlarging and enclosing the fruit; seeds without albumen . . . . *Hernandia.*

CINNAMOMUM, Burm.

Flowers hermaphrodite, rarely polygamous. Perianth of 6 almost petaloid segments, valvate in a double series, deciduous. Stamens 12, in 4 rows, of which 8 reduced to ovate or oblong staminodes opposite to the petals, the remaining 6 fertile with 4-celled anthers, the cells of the 6 outer stamens opening inwards, and those of the 3 innermost ones outwards. Ovary inserted in the centre of the funnel-shaped perianth-receptacle, 1-celled, with a solitary pendulous ovule. Fruit berry-like, supported by the thickened receptacle and sepals.—Trees or shrubs, usually aromatic, with opposite or alternate penninerved or 3-nerved leaves. Flowers in axillary and terminal simple or cymose racemes.

∗ *Leaves 3-5-nerved.*

× Perianth-segments deciduous along a horizontal line above their base or at their middle.

○ Nuts dry, glabrous . . . . . *C. zeylanicum & C. iners.*

○ ○ Nuts drupaceous, more or less sappy.

Leaves quite glabrous . . . . . *C. obtusifolium* & *C. Cassia.*

Leaves puberulous beneath . . . . . *C. sulfuratum.*

× × Perianth-segments entirely persistent; glabrous, leaves caudate, fuscescent in drying . . . *C. caudatum.*

∗ ∗ *Leaves penninerved.*

Drupes ovate . . . . . *C. inunctum.*

Drupes globular . . . . . *C. Parthenoxylon.*

1. **C. zeylanicum,** Breyn; Bedd. Sylv. Madr. t. 242.—*Looleng-kyaw.*—An evergreen tree, all parts glabrous; leaves coriaceous, ovate to ovate- or lanceolate-oblong, 3- or 5-nerved, glabrous, above glossy and veined or smooth, beneath glaucous and rather densely and prominently net-veined, the nerves thin, somewhat prominent or impressed on both sides, the lateral ones evanescent towards the summit, the accessory ones rather obsolete, the margin simple or obscurely nerve-like towards the base; panicle terminal, large, almost silky grey, the pedicels as long as the flowers; perianth-receptacle enlarged, cup-shaped, truncately 6-cleft.—(According to Meissner.)

Hab.—Tenasserim.

Remarks.—Yields the true cinnamom of commerce, the root yields camphor, the liber oil of cinnamom, the leaves oil of clove, and the fruit a peculiar terebintaceous ethereal oil.

2. **C. iners,** Rwdt.—*Looleng-kyaw.*—An evergreen tree (40—60 + (?) + 3—4), all parts glabrous; leaves lanceolate to oblong-lanceolate, on a petiole about ½ an in. long, acute or obtuse at the base, 4-8 in. long, bluntish acuminate, entire, coriaceous and glossy, strongly 3-nerved from above the base, the net-veination more or less visible; flowers small, white, on more or less silvery-silky pedicels of the length of the perianth or somewhat longer, forming slender, long-peduncled, glabrous or somewhat silky cymose panicles in the axils of the leaves or at the end of the branchlets; perianth usually silvery-silky, the segments nearly 1½ lin. long, obovate-lanceolate; nuts elliptically oblong, smooth, brown, nearly ⅔ in. long, ⅓ of which is enclosed in the thickened truncate-6-lobed cup-shaped perianth-receptacle.

Hab.—Tropical forests of Tenasserim.—s : l.

I do not know in what this species should differ from the true cinnamom. The aroma of the bark is variable, and the bark of the roots of *C. obtusifolium* on the Martaban hills is as aromatic as the best Ceylon cinnamom.

3. **C. obtusifolium,** NE.—*Looleng-kyaw.*—An evergreen tree (30—50 + (?) + 3—4), all parts glabrous; bark about ½ in. thick, grey, fibrous, but even, narrowly fissured; cut greenish white; leaves

oblong to oblong-lanceolate, 6-10 in. long, obtuse or almost rounded at the base, on a strong glabrous petiole ½ in. long, more or less bluntish acuminate, rigidly coriaceous, glabrous, glaucous beneath, strongly 3-nerved, the net-veination little visible; flowers white, small, on silk-hairy pedicels longer than the perianth, forming slender glabrous or slightly silk-hairy cymose panicles in the axils of the leaves or crowded at the end of the branchlets; perianth-segments about 1½ lin. long, obovate-oblong; drupes succulent, oblong, small and only about ⅓ in. long; perianth-receptacle not much enlarged and covering only the base of the drupe.

Hab.—Frequent in the tropical forests, all over Burma from Chittagong and Ava down to Tenasserim and the Andamans, up to 2,500 ft. elevation.—Fl. C.S.‖; Fr. H.S.—s.—SS.=Lat. p., SiS., *Metam.*

Remarks.—Wood whitish, turning pale brown or brown on exposure, rather heavy, fibrous but close-grained. The bark of the roots is a good substitute for genuine cinnamom.

4. **C. Cassia,** Bl.—An evergreen tree, all parts glabrous; leaves oblong-lanceolate to lanceolate, on a slender 3-4 lin. long petiole, more or less tapering at the triplinerved base, 3-4 in. long, caudate-acuminate, coriaceous, the net-veination inconspicuous; flowers small, on slender pedicels of about the length of the perianth or somewhat longer, forming short-peduncled, slightly silky, cymose panicles in the axils of the leaves and collected into larger ones at the end of the branchlets; perianth slightly silky, about 1½ lin. long, the segments oblong-lanceolate; drupes sappy, the size of a pea, ellipsoid, glabrous; perianth-receptacle not much enlarged, truncate-6-lobed or the lobes often entirely persistent and not breaking off at their middle.

Hab.—Ava, Kakhyen hills.—Fl. March.

5. **C. sulphuratum,** NE.—An evergreen tree, the younger parts and branchlets velvety-puberulous; leaves lanceolate to elliptically lanceolate, acute or obtuse at the base, on a strong velvety petiole about 4 lin. long, more or less (often shortly) bluntish acuminate, 4-7 in. long, rigidly coriaceous, glossy above, beneath glaucous and minutely puberulous, but glabrescent, from above the base strongly 3-nerved, the net-veination between rather indistinct; flowers white, on slender silk-hairy pedicels, forming a long-peduncled, puberulous, poor-flowered cymose panicle in the axils of the leaves; perianth-segments silvery silk-hairy, about 1½ lin. long, obovate-lanceolate.

Hab.—Southern Tenasserim.—Fl. Oct.-Dec.

6. **C. inunctum,** Meissn.—A tree, the branchlets slender, loosely leaved; leaves occasionally almost opposite, coriaceous, rather long (6-8 lin.) petioled, 2-3 in. long, acute at the base, oval to oblong,

almost acuminate, penninerved, occasionally spuriously triplinerved, glossy, one-coloured, beneath or on both sides somewhat prominently net-veined; panicles short, few-flowered, axillary and terminal, about 1½ in. long; flowers unknown; perianth-cup funnel-shaped, about a line in diameter; berry ovate, the size of a pea.—(After Meissner.)

Hab.—South Tenasserim.

Possibly referable to *C. cecidodaphne*, Meissn.

7. **C. parthenoxylon**, Meissn.—A leaf-shedding (?) large tree, all parts glabrous; leaves from ovate to elliptically oblong, usually rounded at the base, on a slender petiole ¾-1 in. long, shortly acuminate, thin-coriaceous, glabrous, penninerved and net-veined, 3-4 in. long, somewhat glaucous beneath; flowers minute, pale yellow, on slender nearly 2 lin. long pedicels, forming a long-peduncled, slender, glabrous, cymose panicle in the axils of the leaves; perianth slightly pubescent, the segments about ½ lin. long, oblong and rather blunt; berry globular, the size of a small pea, smooth, succulent, dark purple, the perianth-cup little enlarged and flat, with entire margins.

Hab.—South Tenasserim.

Remarks.—This is the so-called Martaban camphor-wood.

8. **C. caudatum**, NE.—An evergreen tree, all parts glabrous; leaves ovate to elliptically ovate, often somewhat oblique, tapering at the base, on a slender petiole 3-4 lin. long, more or less caudate-acuminate, 2-3 in. long, thin-coriaceous or chartaceous, strongly triplinerved, glabrous, turning fuscescent in drying, the veination obsolete; flowers minute, on filiform, 3-4 lin. long, tawny-pubescent pedicels solitary or clustered in the axils of the leaves; perianth ⅔ lin. long, tawny-pubescent; drupes obovoid-oblong, ½-1 in. long, glossy, black, the perianth-tube and pedicel very fleshy, thickened and enlarged, glabrous, up to an inch long, the segments short, rigid, persistent.

Hab.—Ava, Kakhyen hills.—Fl. March.

PHŒBE, NE.

Flowers almost as in *Cinnamomum*, the receptacle shortly funnel-shaped, persistent, along with the often indurated perianth supporting the fruit. Berry seated on a more or less thickened pedicel. In other respects agreeing with *Cinnamomum*.—Trees or shrubs, with alternating or almost whorled penninerved or triplinerved leaves. Flowers in axillary or terminal cymose racemes.

* *All parts, also the inflorescence, quite glabrous* . . *P. lanceolata.*
** *Younger parts and inflorescence more or less tomentose or pubescent.*
Panicle slender; pedicels as long or longer than the perianth; fruits oval . . . . . *P. pubescens.*
Panicle stout; pedicels rather thick, shorter than the perianth; fruits globular . . . . . *P. villosa.*

1. **Ph. lanceolata,** NE.; Brand. For. Fl. 377.—An evergreen middling-sized tree, all parts quite glabrous; leaves lanceolate to linear-lanceolate, acuminate at both ends, 4-7 in. long, coriaceous, glabrous, glaucescent beneath; flowers small, white, on slender, glabrous, 1-1½ lin. long pedicels, forming slender, long-peduncled, simple, glabrous panicles in the axils of the leaves and at the end of the branchlets; perianth glabrous, the segments about a line long, oblong, rather blunt; fruiting perianth and the thickened pedicels a little enlarged and hardened, surrounding the oblong drupaceous black fruit which is hardly ½ an in. long.

Hab.—Not unfrequent in the tropical and drier hill forests from Martaban down to Tenasserim, up to 3,000 ft. elevation.—Fl. Dec.—s.—SS.=Metam.

2. **Ph. pubescens,** NE.—An evergreen tree (30—40 + (?) + 2—3), all younger parts tawny-villous or pubescent; bark about a line thick, pale-coloured, rather even, sprinkled with corky pustules and short fissures; cut dry, pale-coloured; leaves lanceolate to oblong-lanceolate, acuminate at both ends, on a pubescent soon glabrescent petiole varying in length from ½ to (occasionally) 2½ inches, ½-1 (occasionally 1½) ft. long, while young membranous and, especially beneath, fugaceously pubescent, gradually turning glabrescent and of a firm but thin-coriaceous texture, more or less glaucescent beneath; flowers small, white, on pubescent or villous rather thick pedicels of the length of the perianth or a little longer, forming long-peduncled more or less tawny pubescent or villous slender cymose panicles in the axils of the leaves or at the end of the branchlets; perianth pubescent or villous outside, the segments ovate-oblong, acute, about 1½ lin. long, the inner ones a little shorter and rounded; fruiting pedicels thickened; perianth persistent and hardened; fruit oval, the size of a small pea, black, glossy.

Hab.—Frequent in the tropical forests all over Burma, from Ava and Chittagong down to Tenasserim, especially along choungs.—Fl. March-Apr.; Fr. Apr. May.—s.—SS.=SiS. Metam., etc.

Remarks.—Wood yellowish, turning pale brown, rather heavy, close-grained, soft, soon attacked by xylophages.

3. **Ph. villosa,** Wight.—An evergreen large tree, with a girth of 4-5 ft., all younger parts tawny villous or pubescent; bark dark brown, rough; leaves lanceolate to oblong-lanceolate, on a glabrescent petiole ⅔-¾ in. long, more or less acute at the base, shortly

and bluntish acuminate, 4-6 in. long, when full-grown rigidly but thin coriaceous, glaucous-green, pubescent beneath, but soon glabrescent and glaucescent, the nerves and net-veination rather strong; flowers small, white, on short and thick tomentose pedicels shorter than the perianth, forming rather short and robust densely tawny pubescent or tomentose cymose panicles crowded at the end of the branchlets; perianth tawny-tomentose, the segments ovate, acute, about 1½ lin. long; fruiting pedicel somewhat lengthening and thickened, the perianth little enlarged and persistent; fruits globular, the size of a pepper-kernel, black, smooth.

HAB.—Chittagong.

MACHILUS, Rumph.

Flowers almost as in *Cinnamomum*, the perianth consisting of 6 persistent, spreading or reflexed segments which remain unchanged and do not indurate under the fruit, the 3 outer ones often somewhat larger than the inner ones. Stamens 12, as in *Cinnamomum*. Berry globular to oblong.—Trees or shrubs, with alternating penni-nerved leaves. Flowers rather largish, forming racemes or compound cymose corymbs at the end of the branches or in the axils of the leaves; bracts scale-like, deciduous.

* *Leaves coriaceous, glaucous beneath.*
○ Leaves bluntish acuminate, with the margins not reflexed.
Perianth-segments about 2½ lin. long . . . . . *M. Indica.*
Perianth-segments hardly a lin. long . . . . . *M. rimosa.*
○ ○ Leaves blunt, oval, with reflexed margins . . *M. fruticosa.*
* * *Leaves acuminate, hardly chartaceous, one-coloured* . *M. Tavoyana.*

1. **M. Indica,** Lour. (*M. odoratissima,* NE.; Brand. For. Fl. 378).—An evergreen tree (80—120 + (?) + 6—9), in higher elevations remaining stunted, all parts glabrous, or the very young shoots appressed-pubescent; leaves variable, from linear-lanceolate to oblong and elliptically oblong, on a slender glabrous petiole ½-¾ in. long, acuminate or acute at the base, varying in length from 4 to 7 inches, shortly and bluntish acuminate, when full-grown coriaceous, glabrous, beneath more or less glaucescent, elegantly and prominenly net-veined between the irregular nerves; flowers rather small, whitish, on slender 1½-2 lin. long pedicels, forming loose, glabrous or slightly appressed-pubescent panicles of about the length of the leaves at the end of the branchlets; perianth glabrous or appressed-pubescent and glabrescent, the segments about 2½ lin. long, linear to linear-lanceolate, rather bluntish, somewhat enlarging, persistent, and becoming spreading or reflexed under the ovoid nearly ½ an in. long glabrous fruit.

HAB.—Not unfrequent in the moister hill forests of Martaban, at 3,000 to 7,000 ft. elevation.—Fl. March.—s.—SS.=Metam.

2. **M. rimosa,** Bl.—A tree; leaves 2-3½ in. long, coriaceous, tapering or cuneate at the base, on a strong 6-9 lin. long petiole, acute, oblong or lanceolate-oblong, along with the branchlets glabrous, on both sides somewhat immersed-ribbed and minutely areolate, glaucous beneath, the leaf-buds oblong, tawny silk-hairy, the scales blunt and glabrescent along the margins, the lower ones broadly ovate, the upper ones oblong; panicles 3-4 in. long, branched from above their middle, somewhat longer than the leaves, the peduncle rather glabrous; perianth minutely grey-tomentose and almost silky, as long as the hardly 1½ lin. long pedicel, the segments oval, bluntish.—(After Meissner.)

Hab.—Tenasserim.

3. **M. fruticosa,** Kz.—A glabrous shrub, the leaf-buds velvety; leaves ovate to ovate-oblong, 2½-4 in. long, rounded at the base and a little decurrent on the strong, broad, glabrous petiole 2-5 lin. long, glabrous, rigidly coriaceous, blunt and occasionally rotundate at the apex, glaucous beneath, the margins recurved, the nerves and the copious net-veination almost equally prominent; flowers unknown; panicles longer than the leaves, glabrous, long-peduncled, the fruiting pedicels only 1-1¼ lin. long and thickened as in *Phœbe;* perianth minutely appressed-pubescent, the segments spreading, oblong, blunt; fruits globular, glabrous, the size of a pea.

Hab.—Upper Tenasserim, at 4,000 ft. elevation.

4. **M. Tavoyana,** Meissn.—A tree, the younger branchlets and buds minutely yellowish villous, lenticellate; leaves rather thin, hardly chartaceous, elongate-oblong, much narrowed at both ends, 5-7 in. long, on a slender 10-15 lin. long petiole, glabrous, one-coloured, obsoletely immersed-veined, the nerves on both sides slightly prominent; panicles almost terminal, 5-6 in. long, as long as the leaves, puberulous; perianth almost silky-canescent and glabrescent, as long as the 2 lin. long pedicels, the segments ovate, acute, the outer ones somewhat shorter.—(After Meissner.)

Hab.—Tenasserim.

ALSEODAPHNE, NE.

Flowers as in *Cinnamomum,* the perianth nearly wholly deciduous. Berry at the base supported by the presistent, small, cup-shaped receptacle seated on the much thickened club-shaped or obversely elongate-conical pedicel.—Trees, with alternating penni-nerved leaves, the leaf-buds naked or a little scaled. Flowers small, in compound cymose racemes springing from the axils of the leaf-buds or laterally.

1. **A. grandis,** NE.—An evergreen tree (60—90 + 30—40 + 4—10), the young shoots usually minutely tawny-puberulous, the branchlets white; bark rather even, covered with small warts, greenish grey, nearly an inch thick; cut dry, brown; leaves obovate-oblong to obovate, more or less cuneate at the base, on a glabrous stiff petiole 1-1½ in. long, shortly and bluntish acuminate, varying in size from 4-9 inches, thin and rigidly coriaceous when full-grown, glabrous, glaucescent beneath; flowers minute, on slender 1½-2 lin. long puberulous pedicels, forming slender, loose, cymose, slightly puberulous, or glabrescent panicles on long, compressed, glabrous peduncles arising from the axils of the upper leaves or crowded at the end of the branchlets; perianth minutely appressed-pubescent outside, the segments ovate, rather acute, about ⅔ lin. long; stamens rusty-villous; fruiting pedicels curved, up to an inch long, elongate-club-shaped, thick and warted; fruits elliptical or oval, from 1 to nearly 2 in. long, fleshy, bluish black and pruinose, smooth.

Hab.—Frequent in the tropical forests of the southern and eastern slopes of the Pegu Yomah, Arracan and Martaban down to Tenasserim.—Fr. March-Apr.—s.—SS.=SiS. *Metam.* Lat. p.

Remarks.—Wood yellowish, turning brown on exposure to the air, heavy, fibrous, rather loose-grained.

BEILSCHMIEDIA, NE.

Flowers usually those of *Alseodaphne*. Perianth deciduous, the segments usually nearly equal, sometimes minute. Ovary imperfectly 2-celled, with only a single ovule. Fertile stamens 9, with nearly globular 2-celled anthers, the 3 inner ones opening outwards. Staminodes almost sessile or altogether wanting. Berry ovate, resting on the very short, thickened, but not fleshy pedicel.—Trees, with alternating, penninerved, and much net-veined leaves often crowded at the end of the branches. Flowers in loose, usually short, simple, cymose panicles or racemes in the axils of the upper leaves.

Petiole ½-1 in. long, glabrous; perianth-segments about 1½ lin. long; fruits oblong . . . . . *B. Roxburghiana.*
As former, but fruits spherical . . . . . *B. globularia.*
Petiole 1½-3 lin. long, thick, shortly tomentose; perianth-segments about a line long . . . . . *B. macrophylla.*

1. **B. Roxburghiana,** NE.; Brand. For. Fl. 378.—*Shaw-htoo-pen.*—A leaf-shedding tree (50—120 + 25—60 + 4—9), the leaf-buds minutely appressed-pubescent; leaves appearing with the flowers, membranous and smooth, when full-grown 6 to 8 in. long, ovate-oblong to ovate, bluntish acuminate and occasionally blunt, on a glabrous petiole ½-1 in. long, thin-coriaceous, glabrous, shin-

ing above, strongly and laxly net-veined; flowers small, greenish yellow, on 1-1½ lin. long pubescent pedicels, forming usually short pubescent racemes of the length of the petiole or longer or sometimes twice as long, or occasionally reduced to a 3- or few-flowered cyme; perianth shortly appressed tawny-pubescent, the segments nearly equal, oblong, about 1½ lin. long; fruits oblong, about 1½ in. long or longer, bluish black, pruinous.

Hab.—Frequent in the tropical, rarely in the moister upper mixed, forests of the Pegu Yomah and Martaban, up to 2,000 ft. elevation; also Andamans.—Fl. March.—s : l.—SS.=Metam. SiS., etc.

2. **B. globularia,** Kz.—A tree (40—50+15—30+3—4), resembling much the former species, and possibly only a hill form of it; the leaves are more lanceolate, and the fruits spherical of only an inch in diameter, the pericarp much thinner.

Hab.—Rather rare in the drier hill forests of Martaban east of Tounghoo at 3,000 to 4,000 ft. elevation.—Fr. Apr.—l.—SS.=Metam.

3. **B. macrophylla,** Meissn.—Leaves scattered, thin-coriaceous, large, 5-11 in. long, on a thick shortly tomentose petiole 3 to 6 lin. long, obtuse at the base, elliptically oblong, acuminate, glabrous, laxly and prominently net-veined; panicles 6-8 lin. long, naked, raceme-like, crowdedly flowered, somewhat longer than the petiole, and along with the younger branchlets densely and minutely tawny-tomentose; perianth somewhat longer than the pedicel, about a line long, glabrescent, the segments nearly equal; filaments tomentose; fruits unknown. Near *B. Roxburghiana,* but at once distinguished by the shorter thick petioles and small flowers.—(After Meissner.)

Hab.—South Tenasserim.

CRYPTOCARYA, R. Br.

Flowers hermaphrodite, the receptacle urceolate and enlarging, more or less narrowed at the mouth. Perianth-segments 6, equal or nearly so. Stamens 12, the 6 outer ones all perfect with anthers opening inwards, the 3 inner stamens with extrorse anthers furnished with 2 glands at each side, and alternating with as many short staminodes; anthers 2-celled. Ovary immersed in the perianth-tube, which after flowering closes over the ovary and finally becomes more or less fleshy and succulent, completely or nearly so enclosing, and usually consolidated with, the fruit, the limb of the perianth deciduous, leaving a small scar at the apex.—Trees or shrubs, with alternating penninerved leaves. Flowers small, in cymes arranged in axillary racemes or panicles, the upper ones often forming an apparently terminal panicle. Fruiting perianth-tube

globular, ovoid or oblong, having the appearance of an inferior fruit.

Inflorescence and all softer parts minutely ochre-puberulous; adult leaves glabrous . . . . . *C. ferrea.*
All parts, also the inflorescence, more or less covered with a dense rusty-coloured velvety tomentum; leaves pubescent beneath . *C. Griffithii.*

1. **C. ferrea,** Bl.—An evergreen small tree, 20 to 35 ft. high, the branchlets tawny-puberous; leaves oblong to elliptical, acute at the base, on a glabrous rather thick petiole 3-4 lin. long, shortly acuminate, entire, thin-coriaceous, 3-4 in. long, glossy above, glabrous and glaucous beneath; flowers small, shortly pedicelled, forming a small ochre-coloured puberous panicle in the axils of the leaves and much shorter than them; calyx ochraceous-puberous, about a line long.

Hab.—Tenasserim.

2. **C. Griffithiana,** Wight.—An evergreen small tree, the branchlets densely rusty velvety-tomentose; leaves oblong-lanceolate to oblong, on a thick densely rusty-tomentose petiole ½-¼ in. long, obtuse or acute at the base, shortly or almost caudate-acuminate, 4-8 in. long, coriaceous, rigid, entire, with the margins somewhat revolute, above shortly puberulous and opaque, turning glabrous and glossy, beneath more or less glaucous, puberulous, rusty-pubescent on the strong nerves and elegant net-venation; flowers almost sessile, densely fulvous or rusty-tomentose, yellowish green, shorter than the lanceolate rusty-pubescent deciduous bracts forming a robust, densely rusty velvety-tomentose, bracted panicle in the axils of the leaves and shorter than them; berry almost globular, about ½ an in. in diameter, umbilicate, glabrescent.

Hab.—South Tenasserim.—Fl. Jan.

ENDIANDRA, R. Br.

Flowers hermaphrodite. Perianth-segments 6, equal or nearly so. Stamens of the outer series reduced to a thick prominent ring under the perianth-segments or entirely wanting, those of the inner series 3, with extrorse or half-extrorse anthers, alternating sometimes with 3 small staminodes (but these are often absent); glands either 6 at the base of the perfect stamens, but free from them, or none. Ovary not immersed. Berry free, resting on the wholly or partially persistent, but not or scarcely enlarged perianth.—Trees, with alternating penninerved leaves. Flowers in axillary panicles, sometimes almost reduced to cymes.

1. **E. (?) candolleana,** Meissn.—Leaves crowded at the end of the branches, chartaceous, 3½-8 in. long, on a strong 4-10 lin. long

petiole thickened at the base, narrowed and cuneate at the base, obovate or elliptically oblong, very blunt and rounded or shortly and blunt-acuminate, along with the branchlets glabrous or beneath on the nerves minutely puberulous and glaucous, thinly nerved and obsoletely net-veined, above rather prominently net-veined, and the midrib immersed or impressed; panicles 5-6 in. long, almost as long as the leaves, corymbose-branched from the middle; flowers unknown; fruiting pedicels very short and thick; berry naked, ovate-globular, smooth, 9 lin. long.—Very similar to *Cyanodaphne cuneata*, Bl., but differing by the deciduous perianth.—(After Meissner.)

Hab.—Tenasserim.

TETRANTHERA, Jacq.

Flowers dioecious. Perianth-segments 6, equal or nearly so, or rarely unequal or fewer by abortion. Stamens of the outer series usually 6, perfect, of the inner series either 6, perfect, or 3 perfect, alternating with 3 staminodes, or the whole number of stamens increased to 15-30; anthers all inwards 4-celled, in the female flowers rudimentary or none; glands usually 6, one on each side of the 3 inner stamens. Ovary rudimentary or wholly absent in the male flowers, free in the females; style slender; stigma usually variously dilated. Berry resting on the more or less enlarged, flat, concave or cup-shaped perianth-tube, the segments deciduous.—Trees, with alternate or rarely irregularly opposite penninerved leaves. Flowers in cymes reduced to small umbels, heads or clusters within an involucre of 4 concave deciduous bracts, arranged in short racemes or clusters in the leaf-axils or at the leafless nodes.

* *Perianth-tube slightly enlarged under the fruit, flat or slightly concave.*

○ *Limb of perianth wanting and truncate, or very imperfect, and all its lobes or part of them transmuted into stamens. Stamens* 15-30.

Tomentose-pubescent; umbels solitary in the axils of the leaves — *T. tomentosa.*

Almost glabrous or slightly pubescent; umbels clustered or in short racemes . . . . . — *T. laurifolia.*

○○ *Perianth-limb developed, 6-cleft; stamens* 9-12.

× *Leaves coriaceous (all these doubtfully referred here).*

\+ Umbels peduncled.

Leaves oblong-lanceolate, very acuminate, glabrous . . . — *T. Rangoonensis.*

\+\+ Umbels sessile or the peduncle very much reduced.

Leaves oblong or oval, acute, densely fulvous-pubescent beneath — *T. longifolia.*

Leaves broadly oval, rounded or almost retuse at apex, puberulous beneath . . . . . — *T. grandis.*

×× *Leaves chartaceous or membranous.*

+ Branchlets tomentose, pubescent or silk-hairy. Umbels sessile or fascicled.

Leaves from oval to obovate, blunt; petiole ½-1 inch long . *T. monopetala.*
Leaves alternate, lanceolate, usually acute or shortly acuminate; petiole usually less than ½ an in. long . . . . *T. amara.*
As former, but a shrub; leaves more or less opposite, usually bluntish-acuminate . . . . . *T. lancifolia.*
Leaves lanceolate to linear, appressed silky-puberulous beneath . *T. glauca.*

+ + Branchlets glabrous or nearly so. Leaves glabrous.

Leaves obovate or obovate-oblong, long-petioled; umbels sessile . *T. leiantha.*
Leaves lanceolate, glaucous beneath; umbels peduncled . . *T. polyantha.*

* * *Perianth-tube enlarged to a large, fleshy, entire or lobed cup tapering in a longer or shorter thick stalk.*

○ *Umbel solitary, clustered, or forming a reduced umbel-like corymb in the axils of the leaves.*

× *Leaves not glaucous beneath.*

Leaves shortly tomentose beneath and very prominently net-veined . . . . . *T. Martabanica.*

× × *Leaves more or less glaucous beneath.*

Branchlets tomentose; leaves puberulous beneath, thick-chartaceous . . . . . *T. nuculanea.*
Quite glabrous; leaves rigidly coriaceous . . . . . *T. myristicæfolia.*

○ ○ *Umbels disposed in longer or shorter axillary racemes.*

† *Inflorescence and all other parts quite glabrous.*

Leaves uniformly green; branchlets sharply angular . . *T. nitida.*

† † *Inflorescence puberulous to tomentose.*

Leaves slightly glaucous beneath, shortly acuminate; racemes elongate, tawny-tomentose; fruiting-cup entire; berry oblong . . . . . *T. Panamonya.*
Leaves whitish or glaucous beneath and strongly net-veined, shortly acuminate; racemes shortened, tawny-puberulous; fruiting-cup lobed; berry oblong . . . . . *T. albicans.*
Leaves not glaucous beneath, blunt or nearly so; racemes short and tomentose; fruiting-cup entire; berry obovate-globular . . . . . *T. semecarpifolia.*

* *Perianth-tube only slightly enlarged under the fruit, flat or slightly concave.*

1. **T. tomentosa,** Roxb.—A tree, all softer parts velvety pubescent or tomentose; leaves lanceolate to elliptically and obovate-lanceolate, on a tomentose strong petiole 1-½ in. long, acute at the base, 3½-5 in. long, blunt or bluntish acuminate, coriaceous, shortly puberulous above, densely pubescent or villous-tomentose beneath; flowers small, forming tomentose heads on an inch long or shorter tomentose peduncle arising solitary from the axils of the leaves and from above the scars of the fallen ones.

Hab.—Ava (according to Meissner).

2. **T. laurifolia,** Jacq.: Brand. For. Fl. 379.—*Ong-tong,* a name given to all species of the genus.—An evergreen tree (40—60 +15—30+3—5), the branchlets softly tawny-pubescent or minutely tomentose; leaves variable in size and shape, from oblong-lanceo-

late to obovate and obovate-lanceolate, acute to cuneate at the base, on a pubescent or glabrous petiole 1-¾ in. long, shortly acuminate to blunt and also rounded, pubescent on both sides, especially while young, or minutely puberulous to glabrous, membranous to thin-coriaceous, especially above elegantly net-veined; flowers minute, dioecious, whitish, collected by 8-12 in the 4-phyllous tomentose or almost glabrous involucre, forming shortly tomentose or almost glabrous, sessile or peduncled, corymbose umbels of about the length of, or longer than, the petiole; perianth truncate, without lobes; stamens about 14, alternating with as many or more staminodes; ovary globular, in the males abortive; berries globular, the size of a pea, smooth, black, resting on the club-shaped cup.

Prof. Meissner has distinguished many varieties. The Burmese forms might be distinguished into a form with leaves tomentose or pubescent beneath and tomentose peduncles, growing in moister forests and in a dry country form with puberulous (almost glabrous) leaves and peduncles, etc., the latter growing chiefly in the Eng forests of Prome.

Hab.—Frequent in all moister forests all over Burma and adjacent provinces; a glabrescent variety in the Eng forests of Prome.—Fl. Apr. & Oct. —s. & l.—SS.= ∞ Metam. Lat. *SiS.*

3. **T. Rangoonensis,** Meissn.—Branchlets minutely tomentose; leaves rigidly coriaceous, usually unequal at the almost rounded or obtuse base, 2½-5 in. long, on a thin, puberulous petiole 3 lin. long, oblong-lanceolate, sharply acuminate, one-coloured, lively green, above impressed-ribbed and almost veinless, glabrous and glossy, beneath with 10-14 thin nerves at each side, densely and rather prominently net-veined, minutely puberulous turning glabrous; umbels clustered, covered with a pale tawny, short tomentum, on a 1-1½ lin. long thin peduncle.—(After Meissner.)

Hab.—Pegu, Rangoon (according to Meissner).

4. **T. longifolia,** NE.—Branchlets densely brown-tomentose, angular at the end; leaves moderately coriaceous, oval or oblong, acute at both ends, or occasionally blunt at the base or at the apex, 4-12 in. long, on a strong glabrescent petiole 5-7 lin. long, above sparingly and minutely pilose, soon turning glabrous, beneath densely fulvous-pubescent and somewhat glaucous, rather prominently but laxly nerved and net-veined; umbels clustered, rufous-tomentose; peduncle almost none; involucre 4-phyllous, 4-flowered, glabrescent, about 3 lin. in diameter; perianth 6-parted; filaments 9, hirsute.—(After Meissner.)

Var. 2, **nitida,** Meissn.: leaves broadly oblong-oval or obovate, rounded or shortly apiculate at the apex, glossy above, the ribs more spreading.—*Meissner.*

Hab.—Var. 2: Upper Tenasserim (according to Meissner).

5. **T. grandis,** Wall.—An evergreen tree (30—40 + 12—15 + 2—3), the branchlets fulvous or tawny-tomentose; bark brown, ¼-⅓ in. thick, covered with small warts; cut light brown; leaves variable, not only as to texture, but also in nervature, usually very large, obovate to obovate-oblong, on a strong densely tawny-tomentose petiole 1-2 in. long, acute at the base, ⅔-1¼ ft. long, blunt or rounded with a short point, chartaceous or coriaceous, with the exception of the nerves, glabrous and somewhat glossy, beneath shortly tawny-pubescent, the nerves strong and numerous with the transverse net-veination between conspicuous; flowers in rather small involucred umbels, usually several together, the peduncles clustered, axillary.

Hab.—Not unfrequent in the tropical forests all over Pegu, Martaban and Upper Tenasserim.—Fl. March.—s.—SS.=*Metam.* SiS., etc.

Remarks.—Wood yellow with a beautiful lustre, rather heavy, close-grained, very soft. A fine fancy wood.

6. **T. monopetala,** Roxb.; Brand. For. Fl. 380, t. 45.—A tree (40—50 + 10—25 + 3—6), shedding leaves in H.S., all softer parts shortly pubescent; bark about an inch thick, pale-coloured, very uneven and rough, irregularly lacunose; leaves from oblong to oval and obovate, on a rather long (½-1 in.) petiole, unequal at the rounded or obtuse base, varying in size from 2 in. only to 7-8 in., blunt, rounded or almost retuse, thin-coriaceous, above glabrous or nearly so, beneath pubescent, the nerves and transverse veins conspicuous; flowers small, greenish yellow, forming by 5 or 6 dense head-like involucred umbels of about 3 lin. in diameter, arising from the axils of the leaves; partial peduncles about 3 to 6 lin. long, shortly tomentose; involucre 5-phyllous, the leaflets rotundate, concave, pubescent and ciliate; perianth 6-parted, the segments blunt, ciliate; stamens in males slender and exserted, in the females short and included, 9 or sometimes 12 in number; filaments long-pilose; berries ovoid, the size of a small cherry, about 4 lin. long, bluish black, glossy.

Hab.—Rather frequent in the mixed and tropical forests and along river sides all over Burma and adjacent provinces.—Fl. Apr.-May; Fr. July-Sept.—s. ×l.—SS.=*SiS.* Metam. etc.

Remarks.—Wood white, rather light, fibrous, soon attacked by xylophages.

7. **T. amara,** NE.—An evergreen tree (20—30 + (?) + 1½—2), the branchlets more or less brown-tomentose; bark 1-2 lin. thick, smooth and sparingly beset with little pustules, chocolate-brown; leaves lanceolate to elliptically oblong, on a short tawny-tomentose petiole of about ½ an in. length or shorter, acute at the base, shortly acuminate, firmly chartaceous, glabrous above except on the nerves, beneath more or less shortly tomentose, rarely almost glabrous; flowers minute, forming rusty-tomentose rather short-

peduncled involucred umbels, several arising from the axils of the leaves; perianth 6-parted; filaments villous, only the 3 inner ones furnished with a pair of sessile glands above the base; berries the size of a small pea, smooth, bluish black, supported by the thickened 6-lobed perianth-base.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim; also Andamans.—Fl. March-Apr.; Fr. June.—s.—SS.=Metam. SiS., etc.

Remarks.—Wood very pale brown, turning darker on exposure to the air, rather heavy, fibrous, but close-grained, rather soft, soon attacked by xylophages.

8. **T. lancifolia,** Roxb.—Shrubby, the young shoots smooth; leaves alternate, lanceolate, short-petioled, acuminate, glossy above, glaucous beneath, 3-4 in. long; umbels dull yellow, axillary and lateral, nodding, crowded, almost sessile; involucre 4-phyllous, 4- to 5-flowered, the leaflets rotundate, concave; perianth 6-parted; stamens in males 9 exterior and simple, from the base of the perianth-segments, and 3 inner ones, or rather lower ones, from its tube, shorter and with a pair of glands above the base of the hairy filaments; ovary in males wanting; berries oblong, the size of a field-bean, black, smooth, succulent, with a single seed.—(After Roxburgh.)

Hab.—Tenasserim (according to Meissner).

9. **T. glauca,** Wall.—An evergreen tree, the young shoots appressed silky-pubescent; leaves lanceolate to linear, acute at the base, on an indistinctly puberulous petiole up to ½ in. long, acuminate, chartaceous, 3-6 in. long, glabrous above, beneath glaucous and indistinctly appressed-puberulous; flowers small, in dense, head-like, puberulous or almost glabrous involucred umbels on short 2-4 lin. long peduncles or sometimes almost sessile, umbellate, or fascicled in the axils of the leaves; filaments villous; berry oblong, seated on the curved clavate-thickened pedicel expanded at the apex into a circular shallow cup of nearly 2 lin. in diameter.

Hab.—Tropical forests of Chittagong; also Ava.—Fl. C.S.

10. **T. leiantha,** Kz.—An evergreen tree 30-40 ft. high, all parts glabrous; leaves obovate to obovate-oblong, obtuse or acute at the base, on a strong petiole 1½-2 in. long, acute or bluntish, 4-6 in. long, coriaceous, glabrous, in a dried state nigrescent, the 8-9 nerves at each side of the midrib thin but prominent, the transverse veination and net-veination very thin; involucred flower-heads about 2½ lin. in diameter, glabrous, on strong but slender peduncles of ½ in. in length, umbellately arising from above the scars of the fallen leaves.

Hab.—Tropical forests of the Andamans.—Fl. probably March or Apr.—s. —SS.=SiS.

11. **T. polyantha,** Wall.—A tree, the young shoots appressed-pubescent; leaves lanceolate to linear-lanceolate, acute at the base, on a slender petiole up to ½ in. long, acuminate, membranous, glabrous, glossy above, beneath pale-coloured or glaucescent, the lateral nerves very thin; flowers small, pedicelled, in small involucred glabrous umbels resting on short peduncles umbellate in the axils of the leaves or above the scars of the fallen ones; involucre 4-phyllous; pedicels and filaments pubescent; berries almost globular, the size of a small pea, seated on the pubescent fringed calyx, the pedicel slightly thickened.

Hab.—Ava, Kakhyen hills.

* * *Perianth-tube enlarged in a large, fleshy, entire or lobed cup tapering in a thick stalk.*

12. **T. Martabanica** (*J. calophylla*, Kz., not Miq.).—An evergreen tree, about 25-35 ft. high, the branchlets shortly tawny-tomentose; leaves ovate-oblong to lanceolate, acute or acuminate at the base, on a more or less tomentose petiole ½ to nearly an in. long, longer or shorter acuminate, firmly membranous, 3½-7 in. long, above yellowish green and (except the immersed midrib) glabrous, beneath pale-coloured and shortly tomentose, strongly net-veined between the nerves; flowers in a bracted small umbel, on a short (2½-3½ lin.) shortly tomentose peduncle, arising singly from the axils of the leaves or from an axillary short tawny-tomentose shoot with or without young leaves and appearing as if racemose, or sometimes truly in short corymbose racemes on a short tawny-pubescent peduncle; involucre-leaflets concave-rotundate, puberulous; perianth pubescent outside; filaments glabrous; anthers 4-locellate; berries oblong-ovate, nearly half an inch long, smooth, fleshy, resting on a rather large, truncate cup, minutely pubescent outside and narrowed in a short thick pedicel.

Hab.—Common in the drier hillforests of Martaban and Tenasserim at 4,000 to 6,000 ft. elevation.—Fl. Feb.; Fr. March-Apr.—l.—SS.=Metam.

13. **T. nuculanea,** Kz.—An evergreen shrub, the branchlets terete, tomentose; leaves obovate-oblong to oblong-lanceolate, on a pale tomentose petiole 4-5 lin. long, acute at the base, 5-6 in. long, bluntish apiculate, thick-chartaceous, glabrous above, beneath glaucous and more or less densely puberulous, the net-veination between the rather strong nerves thin but conspicuous; flowers apparently forming almost sessile umbels in the axils of the leaves; peduncle in the fruiting specimens very thick and strong, hardly 3 lines long; fruits pale straw-coloured, oblong, about 6-7 lin. long, smooth, resting on an entire, fleshy, large, pedicelled cup.

Hab.—Tropical forests of Upper Tenasserim.—Fr. March.

14. **T. myristicæfolia,** Wall.—An evergreen small tree, all parts quite glabrous; leaves from obovate-oblong to oblong-lanceolate, narrowed towards the acuminate base, on a rather slender petiole 6-8 lin. long, bluntish and often retuse with a minute mucro, 5-6 in. long, rigidly coriaceous, quite glabrous, above glossy and vividly green, beneath glaucous, the net-veination between the thin almost immersed nerves rather obsolete; involucred umbels 4-flowered, on slender, 5-8 lin. long, glabrous peduncles, forming umbel-like sessile or almost sessile clusters in the axils of the leaves; involucre-leaflets 4-6, concave-rotundate, glabrous; perianth quite glabrous; berries obovate-globular, the size of a small cherry, smooth, resting on a large (nearly 8 lin. in diameter), thick fleshy, entire, smooth (in a dried state strongly wrinkled) cup contracted at the base into a slender ½ to 1½ in. long stalk.

Var. 1, **myristicæfolia proper:** cup-stalk variable in length, usually not exceeding ½ an inch.

Var. 2, **longipes** (*Cylicodaphne longipes*, Meissn.): cup-stalk elongated to 1-1½ in. length; fruit and fruit-cup nearly twice the size.

Hab.—Tropical forests of Martaban and especially the Tenasserim provinces; also Pegu, above Rangoon.—Fl. Aug.-Oct.—s.—SS.=*Metam.* Lat. p.

15. **T. nitida,** Roxb.—An evergreen large timber-tree, all parts quite glabrous, the branchlets sharply cornered; leaves oblong, narrowed at the base, on a thick petiole ½ an in. long or somewhat longer, blunt, 5-8 in. long, entire with recurved margin, coriaceous, glabrous, the net-veination between the thin spreading nerves rather indistinct; umbels involucred, 4-5-flowered, on 5-4 lin. long or shorter peduncles, forming a simple glabrous elongate raceme with a pale-coloured angular peduncle springing from the axils of the leaves or from above the scars of the fallen ones; involucre-leaflets 4, rarely 5, concave, glabrous; perianth 6-parted, hairy at the base; stamens in males usually exserted, 9 of them fertile, the 6 outer ones longest; staminodes 9, the outer 6 with a woolly head; in the female flowers all male parts rudimentary, with the exception of the 3 inner staminodes; ovary in males rudimentary; berries oblong, 1-seeded, 6-7 lin. long, succulent, smooth, seated on the 3- to 5-cleft large fleshy cup.

Hab.—Tropical forests in the valleys of the southern spurs of the Pegu Yomah, above Rangoon; rare in Martaban.—Fl. Aug.-Sept.—SS.=Lat. p.

16. **T. Panamonja,** NE.—An evergreen large tree, all parts glabrous, the young shoots minutely puberulous or pruinous; leaves elliptically oblong to lanceolate-oblong, obtuse or acute at the somewhat unequal base, on a puberous petiole ½-1⅔ in. long, acuminate,

½-1 ft. long, thin-coriaceous, minutely puberous, but soon quite glabrous, glaucous beneath; flowers yellowish, in involucred tawny-pubescent umbels forming long, tawny-puberulous or pubescent racemes springing either singly or more usually by pairs from the axils of the leaves or from above the scars of the fallen ones; peduncles tomentose, 2-3 lin. long; involucre-leaflets rotundate, concave, rusty-pubescent; perianth densely rusty-pubescent, 6-parted; filaments hirsute at the base; berries broader than long and almost didymous, the size of a pea, 2-seeded, seated on an entire, small, cup-like expansion of the perianth-base.

HAB.—Tenasserim, apparently frequent.—Fl. Feb.

17. **T. albicans,** Kz.—An evergreen tree (20—25 + (?) +1), the young shoots minutely puberulous; leaves oblong-lanceolate to lanceolate, narrowed at the base, on a slender almost glabrous petiole 5-8 lin. long, shortly acuminate, chartaceous or thin-coriaceous, 6-10 in. long, glabrous, beneath whitish, the net-veination between the thin prominent nerves thin but conspicuous; umbels involucred, velvety-tomentose, on slender greyish-tomentose peduncles about 4 lin. long, forming a shortened or almost sessile velvety-tomentose raceme in the axils of the leaves or more usually above the scars of the fallen ones; involucre-leaflets greyish velvety; fruits resting on a large, fleshy, waved-lobed cup narrowed into a thick pedicel.

HAB.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah, along choungs.—Fl. Apr.—s.—SS.=SiS.

REMARKS.—Wood soft, white.

18. **T. semecarpifolia,** Wall.—An evergreen tree, 25 to 30 ft. high, the branchlets more or less shortly tawny-pubescent; bark about ⅓ in. thick, corky-rough, grey; cut pale, dry; leaves from broadly elliptical-oblong to obovate-oblong, 6-7 in. long, somewhat acute at the base, on a strong slightly puberulous petiole 6 to 8 lin. long, blunt or obsoletely apiculate, rigidly coriaceous, lively green and glabrous above, beneath minutely puberulous and transversely veined between the numerous strong nerves; umbels on short (in fruit hardly 3 lin. long) densely greyish-puberulous peduncles, forming a short tomentose raceme above the scars of the fallen leaves; berries almost the size of a small cherry, somewhat depressed-globular, smooth, resting on an entire, large, fleshy cup minutely pubescent outside and contracted into a short and thick stalk.

HAB.—Not unfrequent in the tropical forests of Martaban, rare in those of the damp valleys along the eastern slopes of the Pegu Yomah.—Fr. Apr.—s.—SS.=*Metam.* SiS.

REMARKS.—Wood yellowish or pale brown, soft.

DODECADENIA, NE.

Flowers hermaphrodite, solitary in the imbricately scaled leaf-buds. Calyx 6-8-parted, the lobes nearly equal and deciduous. Fertile stamens 12-15, all introrse, the outer 6 or 9 glandless, the inner 6 furnished near the base of the filament with a pair of capitate stalked glands; anthers 4-locellate. Ovary pubescent; style short with a funnel-shaped-toothed shaggy stigma. Berry ovate, resting on the flat base of the calyx continuous with the thickened peduncle.—Trees, with scattered penninerved leaves, the buds imbricately scaled; flower-buds axillary and often solitary.

1. **D. grandiflora,** NE.—An evergreen tree, the leaf-buds appressed-pubescent; leaves oblong- to linear-lanceolate, acute at the base, on a slender petiole up to ½ in. long, acuminate or acute, 2-3½ in. long, coriaceous, glabrous; flowers-clusters densely imbricate-scaled, sessile, pubescent, axillary and solitary, the scales appressed-silky; berries ovate, about 2-3 lin. long.

HAB.—Ava, Khakyen hills.—Fl. March.

LITSAEA, Juss.

Flowers dioecious. Perianth 4-6-cleft, the tube shortly obconical, the lobes almost equal, deciduous. Fertile stamens 6 or 9 (in the female flowers often 4-6, ligulate and sterile), the inner ones 2-glandular; anthers 4-locellate, all introrse. Ovary (in the males rudimentary) free. Berry resting on a cup-shaped or almost flat truncate receptacle, the pedicels often thickened upwards.—Trees or shrubs, with alternate or crowded penninerved or rarely triplinerved leaves, the buds imbricately scaled. Flowers axillary, clustered or racemose, rarely solitary, while in bud quite enveloped by the scales of the leaf-buds.

* *Leaves whorled by* 3 *to* 5, *penninerved from the very base; the female flowers in small clustered umbels, the males simply clustered.*

Branchlets tomentose; leaves 4-4½ in. long (doubtful species) . *L. concolor.*
Branchlets and shoots densely tawny-villous; leaves 6-8 in. long, very soon turning glabrous . . . . . *L. angustifolia.*
As former, but leaves 1-1½ ft. long, elongate, also when adult pubescent beneath . . . . . *L. macrophylla.*

** *Leaves scattered, alternate, triplinerved above the base and penninerved further up.*

Leaves, etc., quite glabrous; flowers in short tawny-tomentose racemes . . . . . *L. leiophylla.*
Leaves, etc., quite glabrous, glaucous beneath; flowers in sessile involucred umbels . . . . . *L. foliosa.*

1. **L. concolor** (*Actinodaphne concolor,* NE.).—A tree, the branchlets tomentose from rusty-coloured short hairs; leaves

whorled, rather rigidly chartaceous or almost coriaceous, narrowed and acute at the base, elliptical or oblong, rather bluntish acuminate, beneath pale-coloured, but hardly glaucous, 4-4½ in. long, on a petiole hardly ½ an in. long, above immersed-ribbed and glabrous, beneath minutely scabrous; flowers clustered, rusty silk-hairy. — (After Meissner.)

Hab.—Tenasserim.

2. **L. angustifolia** (*Actinodaphne angustifolia*, NE.; Bedd. Sylv. Madr., 186).—An evergreen large tree, the young shoots densely tawny or ochraceous-villous; leaves crowded at the end of the branchlets, oblong-lanceolate to lanceolate, acuminate at the base, on a villous glabrescent petiole 4-6 lin. long, bluntish and shortly acuminate, thin but rigidly coriaceous, while young more or less tawny-villous, soon turning quite glabrous, penninerved, with the net-veination very obsolete between the nerves, somewhat glaucous beneath, 6-8 in. long (in young plants considerably larger); flowers small, villous, umbellate, on very short tawny-villous peduncles usually several together clustered in the axils of the leaves, the umbels not exceeding the length of the petiole; pedicels in fruit 2-3 lin. long; male flowers simply clustered; filaments pilose; berry obovate-globular, the size of a pea, 2-seeded, resting on a somewhat concave cup shortly tomentose outside.

Hab.—Frequent in the tropical forests of the Pegu Yomah and from Martaban down to Tenasserim.—Fl. Aug.; Fr. March.—s.—SS.=SiS. Metam.

3. **L. macrophylla,** Bl.—A tree, the branchlets, etc., densely fulvous or tawny villous; leaves crowded at the end of the branchlets, 1-1½ ft. long, elongate-lanceolate to elongate-oblong-lanceolate, shortly and bluntish acuminate, narrowed and almost decurrent at the base, on a strong tawny-villous petiole ½-1 in. long, rigidly coriaceous, penninerved, more or less conspicuously transversely veined between the strong nerves, more or less tawny-pubescent and slightly glaucous beneath, glossy above; male flowers clustered, the female ones in small very shortly peduncled villous umbels clustered in the axils of the leaves; pedicels in fruit 2-2½ lin. long, thick, tomentose; berries resting on a fleshy little concave cup somewhat tomentose outside.

Hab.—Tenasserim.

4. **L. leiophylla,** Kz.—An evergreen tree, all parts, except the inflorescence, quite glabrous; leaves lanceolate to oblong-lanceolate, 5-6½ in. long, acuminate and somewhat unequal at the base, on a slender glabrous petiole 1-1½ in. long, slightly and blunt acuminate, thin-coriaceous, quite glabrous, glossy above, beneath slightly or not glaucous, triplinerved and penninerved, the net-veination very obsolete; flowers on short tomentose pedicels, tawny-villous, forming

short, tawny-villous, simple racemes in the axils of the leaves and shorter than the petiole; filaments glabrous.

HAB.—Probably Tenasserim.

5. **L. foliosa**, NE.—An evergreen tree (40—50 + (?) + 3—4), all parts quite glabrous; bark grey; leaves oblong to ovate-lanceolate, more or less acuminate at the base, on a slender glabrous petiole 6-7 lin. long, bluntish acuminate, 3-4½ in. long, thin-coriaceous, glabrous, more or less glaucous beneath, triplinerved, with 2 or 3 nerves at each side, the nerves prominent above, beneath less so and the net-veination almost obsolete; inflorescence while in bud almost globose, sessile, enveloped by the sparingly golden-silk-hairy or almost glabrous scales, solitary or few together in the axils of the leaves; flowers on slender tawny-pubescent pedicels nearly 2 lin. long, corymbose-umbellate; perianth tawny-pubescent outside; filaments long-exserted, slender, glabrous; berries oval, the size of a large pea, smooth, 1-seeded, seated on the somewhat concave thickened base of the perianth-tube.

HAB.—Not unfrequent in the damp hill forests of the Martaban hills east of Tounghoo, at 3,000 to 7,000 ft. elevation; also Chittagong.—s.—SS.= Metam.

REMARKS.—Wood white.

DAPHNIDIUM, NE.

Flowers dioecious. Perianth 6-lobed, the tube shortly obconical. Stamens 9, the 3 innermost ones 2-glandular; anthers (in the females abortive) all 2-celled. Ovary in the males rudimentary. Berry seated on an entire receptacle or supported by the 6-lobed perianth, the pedicels thickened upwards.—Trees or shrubs, with alternate triplinerved or rarely penninerved leaves. Inflorescence in bud concealed in the scaly almost sessile axillary bud-scales; flowers clustered or fascicled, very rarely solitary, sometimes also almost umbellate with a 4-leaved proper involucre.

× *Leaves triplinerved.*

Leaves glabrous, glaucous beneath . . . . . *D. pulcherrimum.*
Leaves densely and shortly tawny-pubescent beneath . . . *D. caudatum.*

×× *Leaves penninerved.*

Leaves beautifully appressed silvery-pubescent beneath; flowers in very short racemes. . . . . *D. argenteum.*

1. **D. pulcherrimum**, NE.; Brand. For. Fl., 383.—An evergreen tree, the young shoots and more especially the bud-scales silky pubescent, the branchlets slightly pubescent and glabrescent; leaves oblong- to ovate-lanceolate, acute and somewhat unequal at the base, on a slender puberulous and glabrescent petiole 5-7 lin. long, long and almost caudate-acuminate, firmly charta-

ceous, 5-6 in. long, glabrous or the ribs towards the base puberulous, 3-nerved or triplinerved, glaucous beneath, the transverse veination thin and conspicuous on both sides; flowers on 1-1½ lin. long greyish-tomentose pedicels, forming dense, bracted and involucred clusters on a very short peduncle or almost sessile in the axils of the leaves; perianth-tube appressed silk-hairy; filaments pilose; berries oblong, 3-4 lin. long, smooth, resting on a slender pedicel hardly thickened at the apex.

Hab.—Frequent in the drier hill forests of the Martaban hills east of Tounghoo, up to 6,000 ft. elevation.—l.—SS.=Metam.

2. **D. caudatum,** NE.—An evergreen tree (25—30+8—12+2—3), all parts more or less shortly tomentose; leaves lanceolate to oblong-lanceolate, often somewhat oblique, on a slender tomentose petiole 3-4 lin. long, acute at the base, long-acuminate, 4-4½ in. long, chartaceous, above rough from a minute pubescence, beneath densely tawny or greyish pubescent, strongly 3-nerved and transversely veined between the tawny-pubescent nerves; flowers minute, bracted, almost sessile, forming dense, small, rusty- or tawny-tomentose clusters in the axils of the leaves; filaments slender, pubescent; berries globular, the size of a pea, supported by the 6-parted spreading perianth resting on a 1-1½ lin. long pedicel hardly thickened at the apex.

Hab.—Common in the drier hill forests of Martaban and Tenasserim, at elevations above 4,000 ft.—Fl. March.—l.—SS.=Metam.

3. **D. argenteum,** Kz.—A leaf-shedding tree (30—40+10—15+3—5), the young shoots silvery silk-hairy; bark grey, ⅓ to ¼ in. thick, brittle, roughish from minute pieces peeling off; cut brown, dry; leaves lanceolate to broad-lanceolate, acuminate at both ends, on an appressed silvery-pubescent glabrescent petiole 3 to 5 lin. long, 3½-6½ in. long, firmly membranous, glabrous above, beneath appressed silvery-pubescent, penninerved, on both sides laxly net-veined; flowers greenish yellow, on very short tomentose pedicels, forming a short densely tomentose raceme at the base involucred by the pubescent concave bracts and while in bud forming globular, pubescent, imbricate-bracted buds; perianth 6-cleft, appressed-pubescent outside; anthers 2-celled, the filaments almost glabrous.

Hab.—Not unfrequent in the low and Eng forests of the eastern slopes of the Pegu Yomah and in Martaban.—Fl. March.—l.—SS.=Lat. Metam. Arg.

Remarks.—Wood yellowish, turning pale-greyish brown, rather heavy, fibrous, rather close-grained, tolerably soft, soon attacked by xylophages.

LINDERA, Thbg.

Flowers dioecious, the perianth 4- or 6-parted, deciduous. Sta-

mens 6-9 (in the females sterile and filiform), the inner 2 to 6 furnished with 2 sessile or stalked glands; anthers ovate to oblong, blunt, 2-celled, all introrse or the inner ones somewhat lateral. Ovary free. Berry seated on a flat, entire, or 6-cleft receptacle.—Trees or shrubs, evergreen or deciduous, with penninerved or triplinerved simple or 3-lobed leaves, the leaf-buds completely or incompletely enveloped by scales. Flowers forming clustered, pedunculed, small umbels or clusters surrounded by a 4-leaved deciduous involucre, the female flowers sometimes solitary.

* *Leaves chartaceous or almost coriaceous, elegantly and prominently net-veined, the reticulations narrow.*

Peduncles slightly pubescent, nearly an inch long; perianth pubescent . . . . . *L. Assamica.*

Peduncles quite glabrous, 3-4 lin. long; perianth glabrous . . *L. nervosa.*

* * *Leaves membranous, very laxly reticulate; all parts glabrous* . . . . . *L. Neesiana.*

1. **L. Assamica** (*Aperula Assamica*, Meissn.).—A tree, the young branchlets sparingly tawny-pubescent; leaves lanceolate, on a slender petiole about ½ in. long, acuminate at the base, 4-5 in. long, caudate-acuminate, rigidly chartaceous, somewhat waved along the margins, glabrous and glossy above, in a dried state chocolate-coloured and somewhat pruinous, sparingly and minutely pubescent on the nerves, but very soon glabrescent, penninerved, the transverse veins conspicuous between the thin nerves, the net-veination only above or on both sides prominent; flowers about a line long, on tawny-pubescent pedicels of the same length, forming a small umbel on slender, nearly an inch long, slightly pubescent peduncles arising by 2 or 3 from an axillary very short minutely tomentose common peduncle; perianth 6-cleft, pubescent outside; filaments all hairy; anthers 2-celled.

Hab.—Martaban hills, on the Nettoung.

2. **L. nervosa**, Kz.—A tree, all parts quite glabrous; leaves elliptically oblong to oblong, somewhat unequal at the rounded base, on a glabrous petiole hardly ½ an in. long, shortly and often abruptly acuminate, rigidly chartaceous, 5-9 in. long, penninerved, glabrous, somewhat paler-coloured beneath, the nerves and net-veination strongly prominent on both sides; fruiting peduncles only about 3-4 lin. long, quite glabrous, several together arising from an axillary short knob; berries oblong, the size of a large pea, smooth, exuding numerous white benzoin-crystals, 1-seeded, supported by the spreading glabrous perianth-lobes and resting on a glabrous very short (1½ lin.) pedicel disproportionally thickened and almost pear-shaped.

Hab.—Tropical forests of Arracan and Upper Tenasserim.—Fr. Feb.—s.—SS.=SiS. Metam.

3. **L. Neesiana** (*Aperula Neesiana*, Bl.).—A leaf-shedding (?) tree (25—30+ (?) +1½—2½), all parts quite glabrous and highly aromatic; leaves variable, from ovate-lanceolate and almost lanceolate to ovate, 3-4½ in. long, rounded or acute at the base, on a slender petiole ½-¾ in. long, sharply acuminate, membranous, glabrous, somewhat glaucescent beneath, penninerved, but in the large-leaved form often almost triplinerved, the nerves thin and the net-veination very lax; flowers on very short but slender white-pubescent pedicels, by 6-8 or fewer in an involucred glabrous umbel, on glabrous slender peduncles considerably varying in length from a few lines to nearly ½ an in., and arising either singly from the axils of the younger leaves or along the axillary short leafless branchlets and thus appearing racemose; perianth-lobes membranous and white-bordered, somewhat woolly within, the perianth-tube densely pubescent; berries almost globular, the size of a small pea, 1-seeded, smooth, seated on a glabrous thickened pedicel about 1½ lin. long.

Hab.—Not unfrequent in the drier hill forests from Martaban down to Upper Tenasserim, at 4,000 to 5,000 ft. elevation.—Fl. Feb.; Fr. Apr.—l.—SS.=Metam.

Remarks.—Yields excellent sassafras.

HERNANDIA, L.

Flowers monoecious. Perianth-segments in two series, all valvate in bud, the rows in the males consisting each of 3 or 4, in the females of 4 or 5 segments. Males: stamens as many as outer perianth-segments and opposite to them, at the base usually 2-rarely 1-glandular; anthers 2-celled, introrse, the valves separating laterally from the inner to the outer edge. Female flowers inserted in a cup-shaped or lobed involucel; glands or staminodes as many as outer perianth-segments and opposite to them. Ovary inferior, fleshy; style short, thick, with a dilated irregularly toothed or lobed stigma. Fruit somewhat fleshy or coriaceous, indehiscent, enclosed in the enlarged fleshy involucel. Seeds globose, without albumen. Embryo with thick, fleshy, deeply lobed cotyledons.—Trees, with alternate, peltate, or palmately nerved leaves. Flowers in loose peduncled lateral panicles, the branchings of which terminate in an involucre of 4 or 5 whorled bracts enclosing 3 flowers (the central flower female, sessile within the cup-shaped involucel, the 2 lateral ones male and pedicelled).

1. **H. peltata,** Meissn.; Bedd. Sylv. Madr., t. 300.—An evergreen tree (40—50+25—20+5—12), all parts glabrous; leaves broadly ovate or rotundate-ovate, peltate, sinuate at the base, on a 3-5 in. long petiole, acute or shorlty acuminate, palmately nerved,

6-8 in. long by 4½ to 6 broad, membranous, glossy above, glabrous, very laxly net-veined; flowers white, rather conspicuous, forming lateral, peduncled, minutely puberulous corymbs; perianth minutely velvety, the lobes oblong, nearly 2 lin. long; males with 3 stamens and 6 perianth-lobes, females with 4 large glands round the ovary, and with 8 perianth-lobes, but no stamens; fruit dry, about an inch long, more or less distinctly 8-ribbed and umbilicate, completely enclosed in the inflated and enlarged, almost globular, fleshy, white involucel of about 1½ in. in diameter, terminated by a circular entire orifice.

Hab.—Common in the beach forests all along the coast of the Andamans.—Fl. March-Apr.; Fr. Jan.-Feb.—SS.=Aren. Ca.

Remarks.—Wood so very light and takes fire so readily that it might be used for tinder.

PROTEACEÆ.

Flowers hermaphrodite. Perianth regular or irregular, deciduous, 4-cleft, the clawed segments valvate, the claws forming a tube, the tube and the lobes at length variously separating into free lobes. Stamens 4, opposite to, and usually inserted on, the perianth-segments; filaments either wholly adnate and the anthers therefore sessile, or more or less free; anthers various, usually all perfect, most frequently with 2 parallel cells adnate to a connective continuous with the filament. Hypogynous or perigynous scales or glands alternating with the stamens, usually 4, but sometimes variously united or reduced in number, or wanting. Ovary 1-celled, with 1 or 2 or more ovules, sessile or stalked, more or less excentrical, with a terminal simple style variously shaped at the apex; stigma small, oblique or lateral. Fruit either an indehiscent nut or drupe or a more or less dehiscent coriaceous or woody follicle, 1- or spuriously 2- or more-celled with as many exalbuminous seeds. Embryo straight, with fleshy cotyledons and a short inferior radicle.—Trees or shrubs, with alternating, scattered, or very rarely opposite or whorled leaves of various shapes and cut and from broad to terete or angular. Flowers often supported by a solitary bract, axillary or terminal, solitary or in racemes, spikes, heads or cones.

A large order, chiefly Australian and South African, of which only a single genus is found in Asia. As to uses, Lindley writes: "Upon the whole, the order must be regarded as one of the most useless to man, notwithstanding the beauty of the flowers and foliage of so many species."

HELICIA, Lour.

Flowers hermaphrodite. Perianth regular, the tube slender,

the blades small, the segments all much revolute when separating. Anthers on short filaments inserted a little below the blades, the connective produced into a short appendage. Hypogynous glands equal, distinct or united in a ring or cup round the ovary. Ovary with 2 ascending ovules laterally attached near the base, sessile, with a long straight style, slightly thickened at the end, the stigma terminal. Drupe nearly globular, the endocarp granular-fleshy. Seeds hemispherical or globular, the testa veined or wrinkled. Cotyledons thick and fleshy.—Trees or shrubs, with alternating, entire or toothed leaves. Flowers by pairs, in simple, axillary or terminal racemes, the pedicels often more or less connate. Bracts very deciduous.

* *Inflorescence axillary or lateral; leaves more or less acuminate, apiculate or bluntish.*
○ Racemes glabrous or nearly so.
Leaves serrate or entire, acuminate at the base and almost decurrent on the ½-⅔ in. long petiole; scales distinct, smooth . *H. cochinchinensis.*
Leaves serrate, on thick 2-3 lin. long petioles; scales united in a 4-toothed cup . . . . . *H. robusta.*
○ ○ Racemes rusty tomentose or villous.
\+ Young branchlets rusty-villous. Leaves serrate.
Ovary smooth; scales not known . . . . . *H. pyrrhobotrya.*
Ovary rusty-hirsute; scales smooth, distinct . . . . *H. excelsa.*
\+ \+ Young branchlets glabrous. Leaves entire.
Ovary rusty-hirsute; scales puberulous, distinct . . . . *H. salicifolia.*
* * *Inflorescence terminal, glabrous; leaves entire, retuse* . *H. terminalis.*

1. **H. Cochinchinensis,** Lour.—An evergreen tree (40+(?)+3—4), all parts quite glabrous; leaves from obovate-oblong to oblong-lanceolate, acuminate and somewhat decurrent at the base, on a glabrous petiole ½-¾ in. long, shortly and rather bluntish acuminate, 4-5 in. long, thin-coriaceous, toothed-serrate, or occasionally more or less entire, glabrous; flowers yellowish, 5-6 lin. long, glabrous, by pairs, on short glabrous pedicels, forming longer or shorter glabrous racemes in the axils of the leaves or above the scars of the fallen ones; hypogynous scales 4, free or nearly so, smooth; ovary smooth, about ½ to 1 in. in diameter, ovoid-globular, not or indistinctly narrowed at the base.

Hab.—Common in the drier hill forests of Martaban, at 5,000 to 7,000 ft. elevation.—Fl. March.—l.—SS.=Metam.

2. **H. robusta,** Wall.; Bedd. For. Fl., t. 301.—An evergreen tree 30 ft. high with a trunk of 3 ft. girth, flowering and fruiting while still a shrub, all parts glabrous; leaves obovate-oblong, more or less narrowed towards the rounded or obtuse base, on a very short (1-2 lin. long) and very thick petiole and appearing almost sessile, shortly and bluntish acuminate, coarsely serrate, chartaceous, glabrous, 6 to 10 in. long; flowers white, 6-10 lin. long and sometimes longer, on short glabrous pedicels, usually by pairs, and

forming a long, slender, quite glabrous raceme in the axils of the leaves; perianth-segments all glabrous and at length revolute to the base, the tube in bud very slender; hypogynous glands forming a 4-toothed cup, or one or a few of them remaining free, glabrous; ovary glabrous; drupes about an inch in diameter, unequally globular, and at the base contracted into a thick and fleshy stalk, apiculate, glabrous.

HAB.—Frequent in the drier and damp hill forests from Martaban down to Tenasserim, at elevations from 2,000 to 4,000 ft.—Fl. end of R.S.; Fr. March-Apr.—l+s.—SS.=Metam.

3. **H. pyrrhobotrya,** Kz.—Probably a tree, very similar to the above, the young shoots rusty-villous; leaves obovate-lanceolate, narrowed towards the obtuse base, on a thick 2-5 lin. long petiole, shortly acuminate, about a foot long, chartaceous, coarsely serrate, when full-grown glabrous or sparingly rusty pubescent along the midrib beneath; flowers 1 to 1¼ in. long, by pairs, on strong 1½ lin. long rusty-villous pedicels, forming about a foot long robust, densely rusty-villous racemes in the axils of the leaves; hypogynous scales ...; ovary and style smooth and glabrous.

HAB.—In the damp hill forests of the Martaban hills, at 4,000 ft. elevation.—SS.=Metam.

4. **H. excelsa,** Bl.—An evergreen large tree with a girth of about 4 ft., the young shoots rusty-villous; bark rough, dark-coloured; leaves obovate-cuneate, acuminate at the base and almost decurrent on about a ½ in. long petiole, shortly and bluntish acuminate, 4-6 in. long, sparingly but coarsely serrate towards the apex, of a firm texture, polished above; flowers yellowish green, about ¾ in. long, with the tube usually straight, by pairs, on short rusty-villous pedicels, forming terminal and axillary densely rusty-villous racemes of about the length of the leaves; hypogynous scales 4, distinct, rotundate, smooth; ovary densely rusty-villous.

HAB.—Chittagong and Tenasserim.—Fl. March-Apr.

5. **H. salicifolia,** Prsl.—A tree (?), the young branchlets quite glabrous; leaves lanceolate, narrowed into a very short (2-3 lin.) petiole, about 1 in. long by 1 broad, bluntish acuminate, entire, coriaceous, glabrous; racemes axillary, solitary, of the length of the leaves, shortly rusty-tomentose; bracts about a line long, linear, very acute, and along with the pedicels and perianth tomentose; hypogynous scales 4, distinct, ovate, rounded, puberulous outside; ovary rusty-hirsute.

HAB.—Tenasserim.

6. **H. terminalis,** Kz.—An evergreen tree (?), all parts glabrous or nearly so; leaves obversely oblong, acuminate at the base and

tapering on the 3 to 5 lin. long slender petiole, 3 to 5 in. long, retuse with a minute mucro, entire or somewhat waved, chartaceous, glabrous; flowers about ½ in. long or somewhat longer, glabrous, by pairs, on a line long pedicels, forming a slender glabrous raceme at the end of the branchlets much longer than the leaves; style glabrous.

HAB.—Ava, Kakhyen hills.—Fl. May.

LORANTHACEÆ.

Flowers usually hermaphrodite, regular. Calyx-tube adnate to the ovary, the limb with as many lobes or teeth as petals, or forming an entire border, or none. Petals or perianth-segments (when the calyx is inconspicuous) 4-6 or rarely more, usually 5 or 6, free or united in a lobed corolla, inserted round an epigynous disk, valvate, rarely wanting. Stamens as many as petals, opposite to, and usually inserted on, them; filaments more or less adnate at the base; anthers basifix, adnate or dorsifix, sometimes versatile, opening by longitudinal slits or by pores. Ovary inferior, adnate to the calyx, and forming one mass of which only the upper part a little protrudes, 1-or 2-celled, with 1 to 3 erect ovules usually not perceptible till the flowering is past; style filiform or thick with a simple stigma. Fruit an indehiscent viscid-fleshy berry or drupe, with a single 1-seeded putamen. Albumen fleshy; cotyledons 2-4, semiterete, fleshy. Embryo fungiform, straight, with a superior radicle.—Parasitical shrubs, usually much branched, very rarely terrestrial shrubs or trees, with opposite or rarely alternate simple leaves, sometimes the leaves reduced to mere scales, or wanting. Bracts usually present, rarely wanting; bractlets 2, close under the flower, concave or united in a cup, sometimes wanting.

An order of no economical value, containing about 23 Burmese species. All the species are more or less injurious to tree-growth on account of their parasitism. The bark is usually astringent. Birdlime is made from the berries of mistletoe and several Loranthi.

Corolla well developed, the lobes more or less united, rarely free; albumen perforated . . . . . *Loranthus.*
Floral parts reduced to an apparently simple perianth; albumen solid; anthers opening inwards in several pores; flowers clustered or cymose . . . . . *Viscum.*
Anthers opening in longitudinal slits; flowers spiked . . . *Ginalloa.*

LORANTHUS, L.

Flowers hermaphrodite. Calyx-limb inconspicuous, truncate or toothed. Petals 4-8, free or more or less united in a tubular corolla, rarely free, spreading or reflexed at the apex. Stamens inserted on the base of the petals; filaments distinct; anthers adnate or

versatile, the parallel cells opening longitudinally. Style filiform with a terminal stigma. Seeds albuminous, the albumen green, peripherical, terete, or 5-6-sulcate, enclosing the embryo in its tube. Embryo vertical, spindle-shaped, the radicle superior. Fruit a berry, usually crowned with the calyx-limb.—Parasitical shrubs, with opposite rarely alternate leaves. Flowers in axillary or terminal racemes, cymes, or solitary, with or without 2 distinct or united bractlets close under the calyx ; bract usually present.

* *Bracts large, leaf-like, forming either a free 4-6-leaved involucre or united in a monophyllous one.*

Leaves glabrous ; calyx tawny-tomentose ; corolla whitish, hairy ; involucre 4-flowered and 4-leaved, the leaflets free and as long as the flowers . . . . . *L. involucratus.*

* * *Bracts minute or small, supporting each single flower.*

○ *Each flower 3-bracted,* i. e., 1 *bract and* 2 *bractlets free or united at the base.*

\+ Corolla 6-lobed, the tube inflated, short and straight.

× Flowers sessile, in short spikes.

Corolla greenish white, 5 lin. long, from the base urceolate-inflated . *L. globosus.*

As former, but corolla about ½ an in. long . . . . . *L. subglobosus.*

× × Flowers pedicelled, in short racemes.

Corolla greenish purple, the tube angular, upwards under the limb inflated . . . . . *L. ampullaceus.*

\+ \+ Corolla 5-lobed, straight or curved.

Leaves not glaucous beneath ; corolla straight and urceolate-inflated, nearly an inch long ; racemes glabrous, poor-flowered, cymose at apex . . . . . *L. Brandisianus.*

Leaves as in preceding, but glaucous beneath ; flowers by 2 or 3 clustered on short glabrous peduncles ; corolla curved and slightly inflated, 1½-1⅔ in. long . . . . . *L. hypoglaucus.*

Leaves one-coloured and glossy on both surfaces ; corolla 2-3 in. long, curved and slightly inflated ; cymes reduced, usually 2-flowered, puberulous . . . . . *L. formosus.*

○ ○ *Each flower with a single bract only or the bract sometimes obsolete.*

\+ Petals united into a tubular corolla.

× Flowers 4-merous, the corolla usually slit laterally; berries obconical to club- and pear-shaped.

Indument of inflorescence, flowers, berries and shoots densely tomentose, white, scurfy ; corolla 1⅓-2 in. long ; berries obconical ; leaves from oblong to ovate-oblong, etc. . . . *L. pulverulentus.*

Indument of young shoots, flowers and inflorescence variable, velvety or villous, from rusty-coloured to whitish ; corolla ½-1¼ in. long ; berries club-shaped, 2-3 lin. long ; leaves from broadly oblong to oblong-lanceolate, etc. . . . . *L. scurrula.*

Indument thin, puberous, whitish or yellowish ; corolla ½-¾ in. long ; berries elongate-club-shaped, about ½ in. long, thin-velvety ; leaves small, obovate-cuneate . . . . . *L. rhopalocarpus.*

× × Flowers 5- or 6- merous, the corolla at length usually slit laterally ; berries rounded at the base, usually oval or ovate.

† Shoots, inflorescence, and flowers densely villous-tomentose.

Tomentum rusty-coloured to pale tawny, persistent; corolla ½ to ¾ in. long; bract often large and conspicuous; leaves usually obovate, densely villous-tomentose beneath; flowers fascicled or very shortly spiked . . . . . *L. tomentosus.*

Leaves very thick-coriaceous, cordate-ovate or ovate, beneath rusty-tomentose; bract 3 times longer than the overy; flowers long spiked . . . . . *L. Siamensis.*

†† All parts glabrous.

Racemes thinly greyish tomentose; corolla ½-1 in. long, 5-merous, yellow or orange, the tube short, inflated, scurfy-tomentose outside . . . . . *L. pentandrus.*

Racemes glabrous, rarely puberulous; corolla 1-2 in. long, crimson or rose-coloured, curved and somewhat inflated at the middle, quite glabrous, 5-merous . . . . . *L. longiflorus.*

++ Petals free to the base; corolla bright red or crimson.

Flowers about 1½ in. long, 6-merous; petals equal and elongate-linear. *L. eleutheropetalus.*

Flowers only about 4 lin. long, 5-merous, the petals dilated at the base and forming apparently a short ovately inflated straight tube; leaves tapering at the base . . . . . *L. pentapetalus.*

As former, but flowers 4-merous; leaves rounded or cordate at the base . . . . . *L. coccineus.*

* *Bracts large, leafy, forming either a free* 4-6-*leaved involucre or united in a* 1-*leafed one. Flowers crowded by* 4 *to* 6 *and usually umbellate.*

1. **L. involucratus,** Roxb.—An evergreen, stout, parasitical shrub, the young shoots often tawny-tomentose, the younger parts pale puberulous and glabrescent; leaves opposite or nearly so, from ovate and cordate-ovate to oblong and elliptically oblong, on a rather slender petiole ⅓ to ½ in. long, sometimes somewhat unequal, entire, 3-4 in. long, more or less blunt, glabrous, coriaceous, but the nerves faintly visible; flowers sessile, nearly an inch long, sparingly puberulous, white, each supported by a large leafy bract, forming a crowded, 4-flowered, almost sessile involucred umbel; involucre-bracts green, about an inch long, ovate-oblong, acute, glabrous or sparingly hairy inside; calyx tawny-tomentose, the tube oblong, the limb obsolete; corolla tubular, sparingly hairy, the tube widening towards the mouth, deeply 5-cleft, the lobes linear, revolute; stamens 5; anthers oval; stigma 2-lobed; berries villous.

Hab.—Chittagong, in forests.

** *Bracts minute or small, supporting each single flower without forming an involucre.*

○ *Each flower* 3-*bracted,* i. e., 1 *bract and* 2 *bractlets free or united at the base.*

1. **L. globosus,** Roxb.—*Khyee-poung,* like all the other species.—An evergreen, small, branched, parasitical shrub, all parts quite glabrous; leaves usually opposite, rarely alternate or by threes, on

a short thick petiole, oblong to ovate or oblong-lanceolate, more or less acuminate, entire, very coriaceous and almost veinless (in a dried state the nerves become visible), 2-4 in. long, smooth; flowers small, greenish orange with yellowish tips, sessile, forming a short glabrous spike in the axils of the leaves; bract free, about half as long as the ovate calyx-tube, cordate-ovate, acuminate; bractlets 2, somewhat shorter and united into an apparently single, broadly oblong, 2-toothed bractlet; calyx-tube oblong, the limb obsolete and almost entire; corolla tubular, 6-sided, upwards inflated, 6-lobed, the lobes linear-oblong, acute, reflexed; stamens 6; anthers oblong; berries globular-oval, the size of a pea, smooth, yellowish green, crowned by the ring-shaped calyx-limb.

Hab.—Frequent all over Pegu, especially in the lower mixed and savannah forests; not unfrequent in Tenasserim and Chittagong.—Fr. Jan.—l.

3. **L. subglobosus,** DC.—Very much like the former, but the leaves narrower and more coriaceous, the nerves in a dried state indistinct or less visible; spikes, etc., as in former, but the flowers appear larger (about ½ in. long), the tube inflated as in *L. ampullaceus,* of which it is probably a sessile-flowered variety.

Hab.—Ava.—Fl. Oct.

4. **L. ampullaceus,** Roxb.—An evergreen branched parasitical shrub, all parts quite glabrous; leaves opposite, on a short thick petiole, oblong to oblong-lanceolate, more or less acuminate, entire, 3-4 in. long, very coriaceous, but the nerves well shown in a dried state, smooth; flowers rather conspicuous, shortly pedicelled, greenish white or greenish yellow, forming short glabrous racemes arising singly or by pairs from the axils of the leaves; bract oval, about half as long as the oval calyx-tube; bractlets conform with the bract, more or less united into a 2-lobed one; calyx-limb almost entire and rotate; corolla 6-lobed, the tube oval-inflated, the lobes linear-spatulate, somewhat reflexed; stamens 6; anthers ovate-oblong; stigma large, capitate; berries elliptically oval, the size of a currant, smooth, yellow, crowned by the calyx-limb.

Hab.—Apparently frequent in Martaban and Tenasserim.—Fl. Feb.-Aug.; Fr. March.—l.

5. **L. Brandisianus,** Kz.—An evergreen parasitical shrub of the habit of the following species, all parts glabrous; leaves opposite or nearly so, lanceolate to elliptically lanceolate, tapering at the base, on a strong petiole ⅓ to ½ in. long, long acuminate, entire, 3-4 in. long, firmly coriaceous, with the lateral nerves hardly visible, glabrous, beneath pale-coloured, but not glaucous; flowers glabrous, about an inch long or somewhat longer, on glabrous pedicels 2-2½ lin. long, forming a short, glabrous, usually 1-2-flowered raceme

terminated by a cyme of 3 or 4 flowers, either singly or by pairs from the axils of the leaves or from above the scars of the fallen ones; bracts somewhat larger, but otherwise conform with the bractlets, ovate, acute, united at the base with the latter; flower-buds 6-cornered; calyx glabrous, the tube elliptically oblong, the limb entire and truncate; corolla 6-cleft, glabrous, about an inch long, the tube already from the base moderately inflated and urceolate-tubular, the lobes linear, reflexed, acute, nearly as long as the tube; stamens 6; anthers linear; style and filaments all glabrous.

HAB.—Martaban hills, at 3,000 ft. elevation.

6. **L. hypoglaucus,** Kz.—An evergreen parasitical small branched shrub, all parts quite glabrous; leaves opposite or nearly so, lanceolate to elliptically lanceolate, tapering in a short petiole, more or less acuminate, entire, 2½-3 in. long, coriaceous, with the lateral nerves hardly visible, glabrous, glaucous beneath; flowers 1½-1¾ in. long, glabrous, bright crimson, on 2 lin. long pedicels, by pairs or threes on short glabrous peduncles which are crowded by 2 or more in the axils of the leaves or above the scars of the fallen ones; bract and the 2 bractlets small, triangular-ovate and united at the base; calyx glabrous, cylindrical, the limb entire, truncate; corolla glabrous, deeply 6-cleft, the tube curved and slightly widened, the lobes linear, reflexed; stamens 6; anthers linear; filaments and the very slender filiform style glabrous.

HAB.—Not unfrequent in the drier hill forests of the Martaban hills, at 5,000 to 6,000 ft. elevation.—Fl. March.—l.

7. **L. formosus,** Bl.—An evergreen rather large parasitical shrub, all parts glabrous, the branches terete or obscurely 4-cornered; leaves opposite or nearly so, ovate to elliptically oblong, acute or obtuse at the base, on a short very thick petiole, acuminate or cuspidate-acuminate, 4-6 in. long, entire, coriaceous and rather dry, with the lateral nerves little visible in a dried state, glabrous, glossy on both sides; flowers nearly 2-3 in. long, crimson, pedicelled, forming very short small minutely puberulous cymes often reduced to a 1- or 2-flowered short glabrous peduncle in the axils of the leaves or above the scars of the fallen ones; bract small, ovate-trigonous; bractlets 2, united at the base, trigonous, smaller; calyx glabrous, the tube oblong, the limb obscurely 5-toothed; corolla 6-cleft, minutely puberulous outside, the tube very long, somewhat widened and a little curved, beautifully crimson, the lobes linear, reflexed and greenish; stamens 6; anthers linear.

HAB.—Burma, probably Tenasserim.

○○ *Each flower with a single small bract only, or the bract sometimes obsolete; bractlets absent.*

8. **L. pulverulentus,** Wall.; Brand. For. Fl., 396.—An evergreen branched parasitical shrub, the younger shoots covered with a white or yellowish densely villous tomentum which is more or less scurfy; leaves opposite and nearly alternate, on a strong ½-1 in. long petiole, ovate-oblong to broadly ovate and oval, blunt or somewhat acute, entire, 4-6 in. long, firmly coriaceous, with the nerves visible in a dried state, while young more or less covered with a very fugaceous floccose tomentum, soon quite glabrous; flowers conspicuous, 1⅓ to 1¾ in. long, green, floccose-tomentose, on 3 to 4 lin. long pedicels, forming short white-mealy tomentose racemes, arising singly or by pairs from the axils of the leaves or from above the scars of the fallen ones; bract small, oval, thick and tomentose; calyx-tube obovate-oblong, covered with a white, scurfy, dense tomentum, the limb ring-like and imperceptible; corolla 4-cleft, white, floccose-tomentose outside, the tube linear-cylindrical, very long and somewhat curved, the lobes linear, reflexed, one-sided, 2 of them separated more deeply; stamens 4; anthers linear; berries large, club-shaped, covered with a white-mealy tomentum.

Hab.—Not uncommon in the Prome district from the plains up to the top of the Kambala; also Ava.—Fl. Sept.-Feb.—l.

9. **L. scurrula,** L.—An evergreen meagre parasitical shrub, very variable in foliage and indumentum, but the shoots invariably covered with a whitish or brownish to rusty-coloured dense short tomentum; leaves opposite, on a shorter or longer petiole, from ovate and cordate to oblong, oval and almost obovate, entire, blunt or bluntish acuminate, coriaceous, with the nerves conspicuous in a dried state, 1½-3 in. long, while very young covered with a thin, velvety, or thick, short, dense tomentum of a silvery-white or brownish colour, soon glabrescent above or rarely on both surfaces; flowers shorter or longer, about ½ to 1¼ in. long, on shorter or longer scaly-tomentose pedicels, forming shortly tomentose, 1- or more-flowered, short and reduced or very rarely developed racemes arising singly or clustered from the axils of the leaves or from above the scars of the fallen ones; bract solitary, ovate, small, thick-tomentose; calyx-tube densely and shortly tomentose, almost pear-shaped or obovate, the limb inconspicuous, truncate and thickened; corolla 4-lobed, more or less densely whitish or tawny to reddish-brown tomentose, the tube in bud cylindrical, slender and almost filiform, at length oblique and slightly swollen, the lobes linear, reflexed; stamens 4, the filaments purple; berries pear-shaped or elongate and pear-club-shaped, 2-4 lin. long, from slightly velvety or almost glabrous to shortly but thinly tomentose.

Var. 1, **scurrula proper:** young shoots covered with a rusty-coloured tomentum; adult leaves glabrous, oval to broadly oval

(and obovate ?), on a $\frac{1}{2}$-$\frac{3}{4}$ in. long petiole; flowers usually solitary or by pairs on a short peduncle, like the berries, covered with a short rusty tomentum; corolla often 1-1$\frac{1}{4}$ in. long.

Var. 2, **obtectus** (*L. obtectus*, Wall.): young shoots covered with a dense rusty tomentum; adult leaves glabrous, oblong to oblong-lanceolate, on a petiole $\frac{1}{2}$ to 1$\frac{1}{2}$, rarely 2-4 lin. long; flowers in short usually paired racemes, like the young berries, covered with a rusty-coloured short villous tomentum.

Var. 3, **buddleioides** (*L. buddleioides*, Desr.): young shoots and under side of leaves whitish or pale-tomentose, the latter ovate to ovate-oblong, on a 3-4 lin. long petiole; flowers usually smaller and more slender, like the young berries, whitish or tawny-velvety, the racemes reduced to few-flowered peduncled or almost sessile fascicles, or sometimes developed, but rather short.

Var. 4, **graciliflorus** (*L. graciliflorus*, Wall.): young shoots tawny-tomentose; adult leaves glabrous and usually narrowly decurrent at the base, on a 2-3 lin. long petiole; flowers as in the preceding variety, tawny-velvety.

Hab.—Frequent all over Burma from Chittagong and Ava down to Tenasserim and the Andamans; on various trees as well in the mixed and savannah forests as in the cultivated lands. Var. 1: not found yet; var. 2: generally; var. 3: not so frequent, but generally; var. 4: on the Pegu Yomah.—Fl. Oct.-May.—l.

10. **L. rhopalocarpus**, Kz.—An evergreen, small, densely branched parasitical shrub about 1-2 ft. high, all parts, except the upper side of the leaves, covered with a minute tawny or rusty-coloured floccose-scurfy tomentum; leaves small, opposite or alternate, from obovate- and oblong-cuneate to cuneate, tapering in a short petiole or sometimes almost sessile, rounded at the apex, entire, coriaceous, with the nervature faint, 1-1$\frac{1}{2}$ rarely 2 in. long, while young on both sides covered with a velvety, thin and somewhat scurfy pubescence, glabrescent above, or when very old almost glabrous on both sides; flowers whitish, about $\frac{1}{2}$-$\frac{3}{4}$ in. long, densely tawny-velvety and somewhat lepidote, on 1-1$\frac{1}{4}$ lin. long pedicels, forming 2-5-flowered, tawny-velvety, almost sessile or shortly peduncled cymes in the axils of the leaves or more frequently irregularly springing from the lower leafless parts of the branches; bract solitary, minute, somewhat cucculate; calyx-tube cylindrically oblong, densely tawny-velvety, the limb truncate and somewhat thickened; corolla 4-cleft, the tube slender, tubular and somewhat curved, covered with a tawny, dense, scurfy-velvety tomentum on the outside; stamens 4; anthers oblong; berries (unripe) elongate and linear-club-shaped, about $\frac{1}{2}$ an in. long, thinly tawny- or rusty-velvety, at the base close above the minute bract sur-

rounded by a ring-like margin, crowned with the obsolete calyx-margin.

Hab.—Frequent in the mixed forests of Pegu and Arracan; also in Upper Tenasserim.—Fl. Oct.; Fr. Jan.-March.—l.

11. **L. Siamensis,** Kz.—A large parasitic shrub, the young shoots densely rusty or fulvous mealy-tomentose, the adult branchlets corky-lenticellate; leaves ovate, cordate or rounded at the base, on a very strong rusty-mealy-tomentose petiole 2-3 lin. long, bluntish acuminate or apiculate, rarely almost blunt, entire, thick and rigidly coriaceous with the nervature quite obsolete, while young rusty-mealy-tomentose, more or less glabrescent, 2-3 lin. long; flowers sessile, forming densely rusty-tomentose 1½-2 in. long spikes arising singly or by pairs from the axils of the leaves; bract single, 3 times longer than the ovary, elliptically oblong, tomentose; calyx densely rusty-tomentose, the limb obsolete, truncate; corolla outside covered with a rusty or ochre-yellow scurfy tomentum, pale and shortly tomentose within, 5-parted (?); berries urceolate-ovoid, the size of a small pea, truncate, densely and shortly tawny- or rusty-tomentose, supported by the bract which is as long as the berry itself.

Hab.—Adjoining provinces of Siam.—Fl. Fr. H.S.—l.

12. **L. pentandrus,** L.—An evergreen parasitical shrub, with thick, rather long, but not much branched stems, all parts glabrous; leaves alternate, variable, from oblong to oblong-lanceolate and almost broadly obovate-oblong and retuse, acute or somewhat decurrent at the base, on a strong petiole very short or up to nearly ½ an in. long, more or less blunt, bluntish apiculate, or rarely bluntish acuminate, entire and somewhat waved, 3-5 in. long, thick-coriaceous, with only the principal nerves visible in a dried state, glabrous; flowers varying in length from ½-1 in., outside greenish and thinly greyish scurfy-puberulous, yellow or dull-orange within, on ¼-1 lin. long pedicels or almost sessile, forming shorter or longer scurfy-puberulous racemes arising singly or by 2, rarely more, from the axils of the leaves or from above the scars of the fallen ones; bract solitary, ovate-oblong, at length more or less spreading; calyx thinly scurfy-puberulous, the tube obovate-oblong, the limb rather unequally 5-toothed; corolla 5-cleft (often to beyond the middle), the segments linear, acute, reflexed, the tube rather short and swollen; anthers orange; berries ovate, about 3 lin. long, minutely greyish velvety, crowned with the short tubular calyx-limb.

Var. 1, **pentandrus proper:** pedicels about ½-1 lin. long.

Var. 2, **farinosus** (*L. farinosus,* Desr.): flowers on very short thick pedicels or rather almost sessile, but sometimes the pedicels are nearly ½ a line long.

Hab.—Very frequent on different trees from Pegu and Martaban down to Tenasserim, as well in the mixed forests as in cultivated lands, up to 3,000 ft. elevation.—Fl. Aug.-Jan.; Fr. Apr.-Aug.—l.

13. **L. longiflorus,** Desr.; Brand. For. Fl., 397.—An evergreen rather large parasitical shrub, all parts glabrous; leaves as in *L. pentandrus,* but still more varying in shape, alternating and opposite, from oblong and broadly ovate to elliptically oblong and (on the younger branchlets or in varieties) lanceolate or linear-lanceolate, blunt to bluntish acuminate, on a thick, short, or sometimes 3-4 lin. long petiole, about 3 to 5 in. long, entire, thick-coriaceous, with the principal nerves more or less visible in a dried state, glabrous; flowers varying in length from 1 to 2 inches, rose-coloured or crimson with greenish or yellow segments, glabrous, on 1-2 lin. long pedicels, forming glabrous somewhat one-sided racemes springing singly or by pairs from the axils of the leaves or from above the scars of the fallen ones; bract solitary, short and broad, concave; calyx almost bell-shaped, the limb truncate and entire; corolla glabrous, very slightly curved and widened, deeply 5-cleft, the segments linear, reflexed; stamens 5, the anthers linear; style 5-sided; berries oblong, glabrous, crowned by the calyx-limb.

Var. 1, **longiflorus proper**: flowers only 1-1¼ in. long, the corolla-tube crimson, the segments yellowish or greenish; racemes usually many-flowered, glabrous.

Var. 2, **bicolor** (*L. bicolor,* Roxb.): flowers 2-2½ in. long and even longer, the corolla uniformly rose-coloured or the segments green or greenish; racemes glabrous.

Var. 3, **falcatus** (*L. falcatus,* L.f): leaves from linear to linear-lanceolate, more or less falcate.

Hab.—Frequent all over Burma down to Tenasserim and the Andamans, in the mixed forests as well as in cultivated lands; var. 2: on the Pegu Yomah; var. 3: in Ava.—Fl. Jan.-Apr.—l.

14. **L. eleutheropetalus,** Kz.—An evergreen parasitical shrub, all parts quite glabrous; leaves opposite or nearly so, lanceolate to elliptically- and linear-lanceolate, tapering on the ⅓-½ in. long petiole, 3-5 in. long, blunt or more or less bluntish acuminate, entire, thick-coriaceous and veinless, glabrous, uniformly green; flowers crimson (?), glabrous, about 1½ in. long, on spreading 2-2½ lin. long pedicels, forming a very lax, elongate (often 3-4 in. long or longer), minutely puberulous and soon glabrescent raceme in the axils of the leaves and at the end of the branches; bract broadly cucullate-oblong, rather small, oblique; bractlets none; calyx minutely puberulous, soon glabrous; the tube cylindrical, smooth, about 2-2½ lin. long or a little longer, the limb truncate and entire;

corolla 6-petalous, in bud minutely puberulous, the petals glabrous, in bud cohering in a cylindrical tube, soon separating to the base, narrow linear, 1⅓ in. long, above the base about 2 lin. broad, erect-spreading; stamens 6, adnate to the petals above their inflexion; filaments and the rather short angular style glabrous; anthers elongate-linear, acuminate.

Hab.—Probably Martaban or Tenasserim.—Fl. Feb.

15. **L. pentapetalus,** Roxb.—An evergreen, large, much branched parasitical shrub, all parts glabrous or the very young shoots rusty-scurfy-tomentose; leaves opposite, on a thick petiole ½-⅔ in. long, ovate and cordate-ovate to ovate-lanceolate, tapering at the base, 3-4 in. long, bluntish acuminate or sometimes apiculate, entire, smooth and glossy, coriaceous, the nerves and net-veination visible in a dried state; flowers small and numerous, crimson, on very short, thick, usually rusty-coloured pedicels, forming straight, simple, usually rusty or tawny-coloured (in a fresh state red) racemes arising singly or rarely by pairs from the axils of the leaves and often as long as these; bract obliquely oval, acute, usually fringed and much shorter than the ovary; bractlets none; calyx limb narrow, obsoletely 5-toothed, the tube cylindrical-oblong, about 1-1½ lin. long; petals 5, free, at their broad bases globosely swollen and 5-sided, the free upper part ligulate and reflexed; stamens inserted on the petals at the constriction; style 4- or 5 (?)-sided, abruptly jointed at about the middle; berries oblong, smooth, greenish yellow.

Hab.—Upper Tenasserim, on trees near the sea; Ava, Kakhyen hills.—Fl. Feb.-Apr.

16. **L. coccineus,** Jack.—An evergreen parasitical shrub, much resembling the preceding species, especially the form with rusty and somewhat scurfy-tomentose branchlets, but the flowers are 4-merous; leaves opposite and alternate, on a shorter and thicker petiole as in the preceding, almost cordate or rounded at the base, of a more coriaceous texture, and therefore the net-veination not or little visible; racemes simple and solitary in the axils of the leaves, somewhat tomentose; flowers small, on very short tomentose pedicels; calyx and petals outside rusty-tomentose; bract cucullate-ovate, acute, densely rusty-tomentose, nearly as long as the ovary; bractlets none; calyx-limb obsoletely 4-toothed, the tube oval, about a line long; petals 4, free, forming with their broad bases a 4-sided, short, globose tube, the reflexed lobes linear; style 4-sided, not jointed; anthers linear.

Hab.—Tenasserim.—Fl. Aug.

VISCUM, L.

Flowers unisexual. Calyx-limb inconspicuous or rarely forming an obsolete line. Petals 3 to 5, very short, having the appearance of a simple perianth. Anthers in males sessile on the petals, short and broad, opening inwards in several pores placed in transverse rows. Stigma sessile. Fruit a 1-seeded berry. Albumen solid. Embryo spindle-shaped, horizontal, excentric, with a lateral radicle.—Parasitical shrubs, with opposite or dichotomous jointed branches and opposite leaves, or leafless. Flowers very small, monoecious and clustered at the nodes, or dioecious and in the forks of the branches.

* *Leafy shrubs. Perianth-lobes deciduous.*

Branchlets terete; leaves obovate-cuneate, rounded at the apex; flowers in sessile or shortly peduncled cup-shaped involucres at the end of the branches or in their forks . . . . *V. album.*

Branchlets angular; leaves more or less blunt; flowers dioecious, in peduncled cup-shaped involucres and axillary . . . *V. orientale.*

Branchlets terete; leaves more or less acuminate; flowers monoecious, in sessile cup-shaped involucres and axillary . . *V. monoicum.*

Branchlets terete; leaves blunt; flowers all solitary in the sessile cup-shaped involucres, forming dense clusters in the leaf-axils or round the joints . . . . . *V. ovalifolium.*

* * *Leafless shrubs. Perianth-lobes usually persistent.*

Articles slightly narrowed at the joints (not conspicuously dilated), longitudinally ribbed, each article of the lateral branchings placed at a right angle with the other, and, therefore, decussate, but twisted so as to appear in one plane; perianth-segments persistent; berries minute . . . . . *V. articulatum.*

As preceding, but joints linear; perianth-segments deciduous; berries ⅛ in. thick . . . . . *V. attenuatum.*

Articles all in one plane and complanate, without any other rib but the median one, at their truncate joints dilated in a complanate cup in which the flowers rest . . . . . *V. moniliforme.*

* *Leafy shrubs. Perianth-lobes deciduous.*

1. **V. album,** L.; Brand. For. Fl., 392.—An evergreen bushy parasitical shrub, all parts glabrous, the branches jointed, terete, repeatedly dichotomous; leaves opposite, obovate-lanceolate or elliptically lanceolate, tapering into a very short thick petiole, blunt, 1½-2½ in. long, thick-coriaceous, in a dried state with 3 to 5 parallel obsolete nerves, glabrous, yellowish green; flowers dioecious, small, greenish, solitary or by pairs, sessile within the 2-bracted involucre, or the peduncle more or less elongated between the 2 flowers and bearing a third flower within an additional 2-bracted smaller involucre; peduncles short and thick, 1-1½ lin. long, usually coming by 3 to 1 from the forks of the branchlets or from between the 2 terminal leaves; bracts oblong-ovate; acute, united into a boat-shaped involucre; calyx-limb obsolete; perianth-lobes 3 (or 4), thick, concave, yellowish, oblong, acute,

about ⅓ lin. long; stigma capitate, almost sessile; male flowers not seen; berries spheroid-elliptical, the size of a pea, smooth, yellowish.

Var. 1, **album proper:** inflorescence more robust, sessile or nearly so; perianth-lobes 4; involucre larger and broader.

Var. 2, **karensium:** inflorescence shorter or longer peduncled; perianth-lobes 3; involucre smaller and narrower.

Hab.—Var. 2: not unfrequent in the drier hill forests of the Martaban hills, at 5,000 to 6,000 ft. elevation.—Fl. Fr. March.—l.

2. **V. orientale,** Willd.; Brand. For. Fl., 393.—An evergreen, much branched, parasitical shrub, glabrous, with almost terete branches, the branchlets in a dried state somewhat angular and obscurely furrowed; leaves opposite, often unequal, elliptical to oblong, narrowed at the base, 3-5-nerved, very variable in size, usually 1½ to 2 in. long, or often smaller, more or less blunt, coriaceous, glabrous; flowers minute, by 3 to 5 sessile within the cup-shaped involucre formed of 2 small oblong-ovate acute bracts, according to Bentham the central one female, scarcely a line long, the 2 lateral ones males and considerably smaller; peduncles short, glabrous, solitary or usually by 3 or 2 in the axils of the leaves, flower-bearing at the end, and often jointed at the middle and bearing 2 other less connate bracts; calyx-limb prominently ring-like in the female buds; perianth-lobes 4, or rarely 3, triangular, each bearing a sessile anther; berries globular, the size of a pea, smooth.

Hab.—Chittagong.

3. **V. monoicum,** Roxb.; Brand. For. Fl., 393.—An evergreen, glabrous, parasitical shrub with numerous dichotomous or opposite terete (in a dried state obsoletely sulcate) branches; leaves opposite, oblong-lanceolate to lanceolate and usually somewhat falcate, tapering into a very short petiole or almost sessile, 5-nerved, 2-3 in. long, more or less acuminate, entire, coriaceous, glabrous; flowers minute, yellowish green, by 3 or fewer sessile between the 2 triangular-ovate small bracts united into a cup-shaped involucre, the lateral flowers usually female, the central male or wanting; flower-clusters sessile or the peduncle very inconspicuous, by 3, 2, or solitary in the axils of the leaves or at the forks of the branches, occasionally springing from axillary, short, leafless shoots and appearing spuriously spiked; calyx-limb ring-like, obsolete; perianth deeply 4-lobed, the lobes triangular-oblong, acute, in the males bearing the sessile anthers; stigma a mere sessile wart; berries oblong, the size of a pea, truncate, smooth, yellowish.

Hab.—Martaban and Tenasserim, apparently rare.—Fl. Apr.

4. **V. ovalifolium,** Wall.—An evergreen, glabrous, parasitical shrub, with opposite terete branches; leaves opposite, oval to ovate-oblong and oblong, shortly tapering into a very short thick petiole, 3-5-nerved, blunt, entire and often waved, 2-3 in. long, coriaceous, glabrous, the nerves and also the principal veination visible in a dried state; flowers dioecious (?), minute, all solitary and resting in the short, sessile, cup-shaped involucre of 2 concave, acute, connate bracts, densely crowded (especially lower down on the branches) into small roundish clusters which often form a sort of interrupted spike on the axillary, short, leafless shoots; calyx barely visible, if any; perianth-lobes 4, free, 3-angular, acute; stigma capitate, sessile; unripe berries oval-oblong, smooth.

HAB.—Tenasserim.

* * *Leafless shrubs. Perianth-lobes usually persistent.*

5. **V. articulatum,** Burm.; Brand. For. Fl., 393.—An evergreen, parasitical, leafless shrub, all parts glabrous, the branches from 1 to 2 ft. long, usually trichotomous and opposite, jointed; articles variable, from linear to linear-oblong, those of the lateral branchings placed at a right angle with one another and decussate, but twisted, so as to appear in one plane, from 1 to 2 to ½ in. long, at the broader end always slightly narrowed, glabrous, with a stronger midrib and (in a dried state) with several (3-9) longitudinal ribs and appearing more or less sulcate-ribbed; flowers minute, solitary, or by 2 or 3 enclosed in the 2 cup-like-connate bracts, sometimes forming small clusters at the joints; calyx-limb none (?); perianth-lobes 3 (or 4), concave, triangular-oblong, acute; stigma small; berries globular, the size of a pepper-kernel, smooth, yellowish.

Var. 1, **articulatum proper:** articles narrow, only 1½ to 2 lin. broad, the lateral ribs fewer in number.

Var. 2, **dichotomum** (*V. dichotomum,* Don): articles broader, 3-4 lin. broad, with numerous longitudinal nerve-like ribs.

HAB.—Common in the mixed forests and cultivated lands all over Burma.—Fl. Fr. Jan.-March.—l.

6. **V. moniliforme,** WA.—An evergreen, small, stunted, parasitical shrub usually only ½ a foot high, rarely larger, leafless, all parts glabrous; branches jointed, compressed, usually trichotomous, the articles all in one plane (not decussately placed), only from 3-4 lin. long or thereabouts, obovate-oblong, when full-grown with a midrib, but without any lateral ribs, at the rather truncate apex dilated into a complanate cup a little expanded at both sides so as to receive the flowers; flowers minute, several, few, or solitary in

the lateral dilatation of the apex of the articles; perianth-lobes 3 oblong-triangular, acute, concave; berries globular, small.

HAB.—Rare in the drier hill forests of the Martaban hills, especially on oaks and *Eurya*, at 4,000 to 6,000 ft. elevation.—Fl. March.—l.

GINALLOA, Korth.

Flowers monoecious (and ? dioecious). Perianth 3-(or 4-) petalled, the petals short and more or less persistent. Anthers in males almost sessile, free, 2-celled and almost didymous, opening in longitudinal slits or on the inner face along the connective; filaments very short, opposite the petals. Stigma in females sessile or nearly so; ovary smooth or sulcate. Fruit a 1-seeded berry.—Parasitical shrubs of the habit of the leaf-bearing *Visci*, but the flowers in longer or shorter spikes, and all the branches and branchlets with a short thickening at the base resembling a spurious sheath.

* *Spikes very slender, the flowers surrounded by an annular-cup-shaped involucre. Leaves thin-coriaceous.*

Leaves elongate cuneate-obovate, 5-nerved . . . . . *G. Helferi.*
Leaves cuneate, narrow linear, only 3-nerved . . . . *G. spathulifolia.*

* * *Spikes robust, the flowers immersed in grooves of the thick rachis, destitute of the annular-cup-shaped involucre.*

Leaves thick-coriaceous, oblong to obovate-oblong . . . *G. Andamanica.*

1. **G. Helferi**, Kz.—An evergreen, slender, parasitical shrub, glabrous, with terete dichotomous branches; leaves opposite, elongate-cuneate-obovate, very much tapering into a very short petiole or rather sessile, rounded or retuse at the apex, 5-nerved, 3-4 in. long or shorter, coriaceous, but the nerves and veination fairly visible in a dried state; flowers minute, dioecious, the males usually by 3, the females by 3 or solitary in the truncate half-cup-shaped bract-involucre adnate to the rachis and forming a slender, interrupted, glabrous spike in the forks of the branchlets or terminal between the 2 uppermost leaves; calyx-limb obsolete; perianth-segments 3, triangular, acute, in the males bearing the 2-celled, ovate, rather large, sessile anthers; ovary oval.

HAB.—Tenasserim.

2. **G. Andamanica**, Kz.—An evergreen, rather large, parasitical shrub, all parts quite glabrous, the stems terete and dichotomously branched; leaves opposite, from oboval to oval-oblong, somewhat oblique at the base and contracted into a very short, thick, flat petiole, rounded at the apex, entire, and slightly waved, 1½ to 2 in. long, glabrous, thick-coriaceous, the 3-5 nerves little visible in a dried state; flowers dioecious (?), minute, sessile, and by 3 or 4 (or more ?) immersed each separately in the thick rachis at its joints and

surrounded with a thin dilatation in place of an involucre; spikes from 1-4 in. long, glabrous, robust, arising from the forks of the branches and terminal between the 2 uppermost leaves; calyx-limb obsolete, if any; perianth-segments 3, minute, 3-angular, connivent (?); stigma obscurely conical, small; unripe berries elongate-ovate, smooth, truncate or crowned by the longer persistent perianth-segments.

HAB.—In the tropical forests of South Andaman, on *Artocarpus chaplasha*. —Fl. Apr.-May.—l.

SANTALACEÆ.

Flowers hermaphrodite or polygamous. Perianth simple or very rarely double, the tube wholly or partially adnate to the ovary and confluent with the pedicel, the limb 3-5-lobed or -cleft, valvate or nearly so, deciduous or persistent. Stamens as many as perianth-lobes and opposite to them, inserted at the base or within the free part of them; filaments short; anthers 2- rarely 4-celled, erect or dorsifix, usually opening in longitudinal slits. Disk epigynous and often plain, sometimes with free margins and crenate. Ovary inferior, or first free and soon adnate, or half-inferior (rarely superior), 1-celled, with 2 to 5 ovules suspended from a free, central, erect placenta. Fruit an indehiscent nut or berry, 1-seeded from abortion. Albumen fleshy. Embryo straight with a superior radicle, the cotyledons linear or oblong, convex, shorter than the radicle.—Shrubs or herbs, rarely trees, terrestrial or sometimes parasitic, with alternate, rarely opposite, simple leaves. Stipules none. Flowers usually small, green or purplish, in terminal or lateral heads, cymes or spikes.

* *Ovary inferior.*

\+ *Placenta slender, bearing the ovules at the apex.*

Perianth-lobes and stamens 5 or 6; disk concave or convex, without free margins; drupes very small; parasitical shrubs, with glabrous flowers . . . . . *Henslowia.*

Perianth-lobes and stamens 5 or 4; disk cup-shaped, 5-lobed; drupe pear-shaped, large; terrestrial shrubs or trees, with hairy flowers . . . . . *Pyrularia.*

\+ \+ *Placenta spindle-shaped, bearing the ovules near the base.*

Perianth bell-shaped, lobes and stamens 4 or 5; disk conspicuously lobed; drupes globose; terrestrial trees parasitical while young . . . . . *Santalum.*

* * *Ovary superior.*

Inflorescence while young conspicuously imbricate-bracted; flowers 4-merous; filaments very short, complanate . . . *Lepionurus.*

Inflorescence with very deciduous minute bracts; flowers 5-merous; filaments slender, exserted . . . . . *Champereia.*

HENSLOWIA, Bl.

Flowers monoecious. Free part of perianth 5- rarely 6-cleft,

the lobes inflexed, persistent. Stamens 5 or 6, inserted opposite to the perianth-lobes near their base; filaments minute, subulate; anthers dorsifix, introrse, the cells almost didymous, dehiscing by a transverse slit. Disk epigynous, concave or convex, with the margins not free. Ovary inferior, 1-celled, with 2-4 ovules suspended from the apex of the free central placenta; style short, with a 3-5-lobed stigma. Fruit an ovoid or globular fleshy drupe, containing a hard 1-seeded putamen. Albumen deeply lobed. Embryo central, straight; radicle superior, much longer than the cotyledons.—Parasitic shrubs, with alternate 3-7-nerved simple leaves. Flowers minute, in small axillary cymes or spikes or solitary.

* *Flowers in sessile clusters; bracts densely imbricate, rotundate, with broad membranous margins.*

Branches and branchlets densely but minutely warted; perianth-lobes 5 . . . . . *H. granulata.*

** *Flowers in peduncled* 1- *or more-flowered involucred umbellets; bracts acute, without membranous borders.*

Flowers sessile or nearly so; perianth-lobes 5; leaves coriaceous . *H. heterantha.*

Flowers pedicelled; perianth-lobes 6; leaves very thick coriaceous *H. coriacea.*

1. **H. heterantha,** H.f.—An evergreen, small, parasitical shrub, all parts quite glabrous, the branches usually slightly rimose-lenticelled, the branchlets more or less smooth and angular; leaves obovate to elliptical, cuneate at the base and decurrent on the longer or shorter petiole, rounded at the apex, entire, coriaceous, 1½ to 2½ in. long, 5-9-nerved, smooth, shining above; flowers dioecious, minute, greenish, sessile or nearly so, the males by 5 or 6, the females often solitary, on 1½-2 lin. long peduncles bracted at the base and at the apex, arising singly or more usually by 2-3 from the axils of the leaves or in clusters from the scars along the older branches; involucre-bracts shorter than the flowers, 4-6, ovate, acute, often minutely ciliate, basal bracts conform with those of the involucre, imbricate, usually interspersed with a rusty-coloured villous tomentum; perianth-lobes usually 5, somewhat inflexed, ovate, acute, about ¼ lin. long; stamens as many; drupes small, about 1½-2 lin. long, ellipsoid-oblong, smooth, yellow, crowned by the closed perianth, the putamen thin but hard, with 5 membranous plates projecting into the lobes of the solitary seed so as to appear spuriously 5-celled.

Var. 1, **heterantha proper**: flowers sessile or nearly so; perianth-lobes 5.

Var. 2, **coriacea**: flowers shortly pedicelled; perianth-lobes 6.

Hab.—Frequent in the hill forests, especially the drier ones, of the Martaban hills east of Tounghoo, at 4,000 to 7,000 ft. elevation.—Fl. March.

SANTALUM, L.

Perianth bell-shaped, 4- rarely 5-cleft, the lobes ovate or triangular. Stamens as many as perianth-lobes and opposite to them; filaments ligulate or filiform; anthers ovoid, 2-celled, the cells deeply 2-chambered, opening in a longitudinal slit. Disk concave, adhering to the bottom of the perianth-tube, lobed, the lobes alternating with the perianth-lobes. Ovary at first free, turning at length inferior, 1-celled, with 2-4 pendulous ovules attached near the base of the central ovoid placenta; style conical or cylindrical; stigmas 2-4. Drupe globular or obovoid, crowned with the scar of the fallen perianth, containing a woody 1-seeded putamen. Embryo cylindrically spindle-shaped; radicle superior, much longer than the cotyledons.—Trees or shrubs, parasitical while young, with usually opposite, rarely alternate, simple leaves. Flowers small, in terminal and axillary cymes. Bracts and bractlets deciduous.

1. **S. album,** L.; Bedd. Sylv. Madr., t. 256; Brand. For. Fl., 398.—*San-ta-ku.*—An evergreen tree (30—40+8—15+3—4) or rarely shrubby, all parts glabrous; leaves opposite, oblong to oblong-lanceolate, on a slender petiole 3-4 lin. long, acute or blunt, entire, 1½-3 in. long, almost coriaceous, glabrous, glaucous beneath; flowers small, yellowish, soon turning brownish purple, on short pedicels, forming terminal and axillary, glabrous, peduncled cymes shorter than the leaves; perianth bell-shaped, 4-lobed; disk-lobes large and conspicuous, alternating with the 4 stamens, obovate-rotundate, thick and fleshy; stigma 4-lobed; drupes globular, the size of a large pea or cherry, smooth, marked with the circular scar of the fallen perianth.

Hab.—Chittagong, cultivated; Southern Tenasserim (according to Rev. Dr. Mason).—Fl. Fr. nearly ∞—1.

Remarks.—Wood white or yellowish. The young trees furnish the white, the old ones the yellow sandal-wood, burnt as a perfume. Ground into powder it forms a favourite cosmetic with Burmese ladies. A valuable oil used as perfume is distilled from the wood. In Hindostan it is also employed for trunks, cabinets, work-boxes and walking-sticks.

LEPIONURUS, Bl.

Calyx adnate to the cup-shaped disk, remaining unchanged in fruit. Petals 4, inserted at the margin of the disk, at base cohering in a tube, valvate. Stamens 4, opposite to the petals; filaments very short. Ovary free, 1-celled, containing a single pendulous ovule; stigma sessile. Drupes berry-like, with a crustaceous nut.

Seed spuriously erect. Albumen fleshy.—Small trees, with entire leaves. Flowers minute, racemose.

1. **L. sylvestris,** Bl. (*L. oblongifolius,* Mast. in H.f. Ind. Fl., i. 83).—A small evergreen tree, all parts glabrous; leaves from oblong to almost lanceolate, acute or obtuse at the base, 6-8 in. long, very shortly petioled, acuminate, entire, membranous turning chartaceous, glabrous; flowers small, white, in lax axillary glabrous whitish racemes, while young covered with scale-like ciliolate imbricating bracts each hiding 3 flowers; drupes elliptical-oblong, orange-coloured, the size of a large pea, smooth.

Hab.—Ava hills.

CHAMPEREIA, Griff. (not of Baill.).

Perianth 5-sepalous, rotate. Stamens 5, inserted at the base of the perianth-segments. Hypogynous disk annular. Ovary superior, with a single, erect, anatropous ovule; style none. Drupe oblong, 1-seeded Embryo inverted in the axis of the fleshy albumen; cotyledons 3.—Trees or shrubs, with alternate leaves. Flowers minute, racemose-panicled. Bracts very minute.

1. **C. Griffithii,** Planch.—A small evergreen tree, all parts glabrous; leaves lanceolate to ovate, acute at the base, very shortly petioled, acuminate to acute, 3-6 in. long, coriaceous; flowers minute, fuscescent, very shortly pedicelled, racemose, forming slender glabrous panicles in the axils of the leaves and usually shorter than them; perianth-lobes about ½ lin. long, reflexed; ovary shorter than the annular lobed disk; drupes elliptically oblong, ¼-⅓ in. long, orange-coloured, glabrous, the endocarp thin-crustaceous.

Hab.—Not unfrequent in the tropical forests of the Andamans; also Tenasserim.—Fl. Feb.; Fr. begin. of R.S.—s.—SS.=petrophilous.

ELÆAGNACEÆ.

Flowers regular, hermaphrodite, sometimes unisexual by abortion, rarely dioecious. Perianth inferior, usually forming a 2-4-lobed bell narrowed or contracted into a shorter or longer tube. Disk filling the perianth-tube and variously prominent along its margin, rarely consisting of 8 glands. Stamens rarely free, usually adnate to the perianth, as many or twice as many as perianth-lobes; anthers 2-celled, the cells dehiscing longitudinally by a double slit. Ovary free, enclosed in the perianth-tube, which enlarges in fruit, 1-celled, with a solitary erect ovule; style simple, elongate. Fruit enclosed in the dry or more usually fleshy or sappy enlarged perianth-tube, drupaceous, the spurious pericarp horny or chartaceous, smooth or woolly or scaly within. Embryo erect, surround-

ed with a very thin albumen, with an inferior radicle, the cotyledons narrow.—Shrubs or trees, often scandent, sometimes spiny, all parts more or less covered with minute silvery or coppery scales. Stipules none. Leaves simple, alternate, or rarely opposite. Flowers solitary or clustered, sessile or pedicelled, axillary.

ELÆAGNUS, L.

Flowers hermaphrodite or male by abortion. Perianth 4-, rarely 5-8-lobed, the limb valvate, bell-shaped or tubular, and at the base contracted into a tube. Disk glandular. Stamens 4, rarely more, inserted on the perianth and alternating with its lobes. Ovary 1-celled with a single erect ovule ; style simple, subulate, somewhat recurved and stigmatic along the one side of the apex. Fruit a fleshy or rarely a dry drupe, the putamen 1-seeded, bony, from terete and sulcate to ribbed and shortly angular, glabrous, lepidote or silky-woolly inside.—Shrubs, usually scandent, rarely trees, often spiny, more or less silvery lepidote, with simple leaves.

Drupes 1½ in. long, the putamen sulcate with rounded ribs . . *E. arborea.*
Drupes 4-6 lin. long, the putamen slightly and bluntish sulcate-ribbed . . . . . *E. conferta.*

1. **E. arborea,** Roxb.—*Min-gu.*—An evergreen tree (20—35 + 2—4 + 2—3), with the branches scandent and long-spiny, all softer parts covered with minute silvery or occasionally coppery scales ; leaves oblong to obovate-oblong, shortly acuminate, on a silvery scaly petiole 3-4 lin. long, blunt or rounded at the base, 4-6 in. long, chartaceous, glabrescent above, beneath densely silvery and somewhat coppery scaly ; flowers clustered in the axils of the leaves, few together, or forming a very short raceme ; perianth-limb bell-shaped, abruptly contracted into a short tube, whitish and glabrous within, densely silvery or coppery scaly outside ; style pubescent ; drupes 1½ in. long, elongate-oblong, sprinkled with silvery scales, orange-coloured, very sapid and acid, edible, the putamen somewhat spindle-shaped and compressed, more than an inch long, densely white-woolly within, sulcate-ribbed, the ribs rounded.

Hab.—Frequent in the tropical forests of the Pegu Yomah ; also Ava and Tenasserim.—Fl. Dec.-Jan. ; Fr. March.—s.—SS.=SiS. Lat. p., etc.

Remarks.—Wood white, soft.

2. **E. conferta,** Roxb.—An evergreen, large, scandent shrub, all softer parts covered with silvery scales intermixed with copper-coloured ones ; leaves oblong to oblong-lanceolate, obtuse at the base, on a coppery-scaly petiole 3-4 lin. long, shortly acuminate, 3-5 in. long, chartaceous, glabrescent above, beneath densely silvery or somewhat coppery scaly ; flowers shortly pedicelled, yellow,

forming dense clusters in the axils of the leaves; perianth bell-shaped, at the base abruptly contracted into a short tube, externally covered with silvery and coppery scales, glabrous within; style pubescent; drupes small, oblong, 4-6 lin. long, red, succulent, the putamen slightly and obtusely sulcate-ribbed or almost smooth, densely white-woolly within.

Hab.—Chittagong.—Fl. C.S.; Fr. Feb.-March.

THYMELÆACEÆ.

Flowers usually hermaphrodite, rarely unisexual. Perianth tubular funnel- or bell-shaped, naked at the throat or furnished with scales or glands, 4-5-lobed, imbricate or rarely valvate. Hypogynous glands minute, 4-8, somewhat fleshy or filiform, inserted around the ovary, either free or united in an entire or toothed ring or cup, rarely wanting. Fertile stamens usually as many or twice as many as perianth-lobes, rarely only 2, inserted to the throat or tube in a single or 2 superposed series and opposite to the lobes or the lower ones alternating with them; anthers 2-celled, the cells dehiscing usually inwardly by 2 longitudinal slits. Ovary free, 1- or rarely 2-celled, with 1 or rarely 2 or 3 pendulous ovules. Fruit indehiscent and nut-like, drupaceous or berry-like, or rarely a 2-valved capsule. Seed pendulous, the pericarp thin or crustaceous, rarely fibrous-woody. Albumen none or rarely present. Embryo straight with a superior radicle; cotyledons fleshy, plano-convex.—Shrubs or trees, rarely herbs, with simple, opposite, or alternate leaves. Stipules none. Flowers often in heads, umbels, clusters, racemes or spikes, often silk-hairy outside.

An order characterised by the peculiar loose bark of caustic qualities which acts upon the skin as a vesicatory. The fruits of many are poisonous. Paper is made from the inner bark of several species of *Daphne*. Eagle-wood, containing a fragrant resin of a dark colour, comes from *Aquilaria agalochum*.

* *Ovary* 1*-celled, with a solitary pendulous ovule.* (*Stamens twice as many as perianth-lobes.*)

× Perianth-throat naked, *i. e.*, without scales or glands.

Hypogynous scales none; leaves alternate . . . . . *Daphne.*

Hypogynous scales 4; leaves opposite . . . . . *Wickstroemia.*

× × Perianth furnished with scales or glands, either inserted at the throat itself or alternating with the stamens.

Perianth-scales 5, petaloid; flowers in involucred heads . . *Lasiosiphon.*

Perianth-scales 10, or if 5, these 2-cleft. Flowers with a discoloured 2-phyllous remote involucre, in slender panicles . *Linostoma.*

* * *Ovary either* 2*-celled with* 1*-ovuled cells, or* 1*-celled with* 2 *parietal* 1*-ovuled placentas.*

× Perianth-throat with free or connate scales variously shaped.

Scales hairy; ovary and capsule sessile or nearly so . . . *Aquilaria.*
Scales glabrous; ovary and capsule stalked . . . . *Gyrinops.*
× × Perianth-throat naked, *i. e.*, without scales.
Perianth 4-merous; fruit drupaceous, sappy . . . . *Phaleria.*

DAPHNE, L.

Flowers hermaphrodite. Perianth tubular or funnel-shaped, deciduous, 4-lobed, the throat without scales. Hypogynous disk obsolete or none. Anthers inserted in 2 superposed rows of 4 each, nearly sessile. Ovary 1-celled with a single ovule; stigma capitate, sessile or nearly so. Drupe fleshy, succulent, or rarely coriaceous, 1-seeded, the testa crustaceous. Albumen none or scanty. Embryo fleshy, with 2 plano-convex cotyledons.—Shrubs or very rarely little trees, with alternating leaves. Flowers usually in terminal or lateral heads or clusters often involucred.

1. **D. pendula,** Sm.—An evergreen shrub, all parts glabrous; leaves lanceolate to broadly lanceolate, acuminate at both ends or occasionally bluntish at the apex, on a 1½-2 lin. long petiole, membranous or thin-chartaceous, glabrous, 4-6 in. long, more or less glaucous beneath; flowers about 6 lin. long, tubular, yellow, densely pubescent outside, sessile, and forming a 4- to 7-flowered head at the end of a very slender minutely pubescent or glabrous peduncle up to 8 lin. long, while in bud protected by a 2-phyllous involucre; involucre-leaflets rotundate-oblong to oblong, minutely pubescent; drupes by several packed into a loose head, ovoid, at the base tapering and surrounded by long hairs, glabrous, unripe about 2 lin. long.

Hab.—In the damp hill forests of the Martaban hills east of Tounghoo, at 5,000 to 6,000 ft. elevation.—Fl. Apr.—s.—SS.=Metam.

LINOSTOMA, Wall.

Flowers hermaphrodite. Perianth bell-shaped, 5-lobed, persistent or deciduous, of a thin texture, at the throat furnished either with 10 free or 5 two-cleft glabrous scales. Stamens 10, almost in a single series and alternating with the perianth-scales. Hypogynous scales none. Ovary sessile, 1-celled, with a solitary pendulous ovule; style capillary, with a capitate stigma. Nut dry, oval or ovate, appressed hairy and glabrescent, surrounded by the fragile very thin perianth and usually crowned with its limb. Seeds solitary, with a thin crustaceous pericarp. Albumen none. Embryo minute, with 2 large half-obovate cotyledons.—Erect or half-scandent shrubs, with opposite leaves. Flowers in few-flowered umbellets on long peduncles furnished with 2 (occasionally up to 4) discoloured, floral leaves.

* *Glabrous shrubs. Perianth-scales* 10, *free.*
Leaves obovate, blunt, or rounded with a mucro . . . . *L. pauciflorum.*
Leaves ovate-lanceolate to lanceolate, acuminate . . . . *L. decandrum.*
* * *Tomentose shrubs. Perianth-scales* 5, 2-*cleft.*
Floral leaves coriaceous; petioles inserted with a broad base to a knob on the peduncle and reflexed . . . . . *L. scandens.*
Floral leaves thin, chartaceous; the petioles thin and not thickened at their insertion to the peduncle . . . . . *L. Siamense.*

1. **L. pauciflorum,** Griff.—An evergreen, erect shrub, 4-6 ft. high, with spreading slender branches, all parts quite glabrous; leaves small, 1-1¼ in. long, from obovate to obovate-oblong, on a very short slender petiole, rather acute at the base, rounded or almost retuse with a mucro, chartaceous, entire, glabrous, somewhat glaucous and elegantly parallel-nerved beneath, the margins reflexed so as to appear thickened; flowers by 2 (or more?), on a slender, filiform, glabrous peduncle, bearing below its middle 2 alternate, white, oblong, thin-chartaceous, net-veined, glabrous floral leaves; perianth slender, glabrous; nut oval, the size of a pea, appressed hairy, enclosed in the brown, very thin, fragile perianth and crowned with its limb.

Hab.—Frequent in the drier hill forests, especially the pine forests, of the Martaban hills east of Tounghoo, at 3,000 to 4,000 ft. elevation.—Fr. March.—l.—SS.=Metam.

2. **L. decandrum,** Wall.—An evergreen shrub with numerous dichotomous elegant branches, all parts quite glabrous; leaves ovate- to oblong-lanceolate, on a 2 lin. long petiole, long-acuminate, 2-3 in. long or somewhat longer, chartaceous, glabrous, glossy above, elegantly parallel-nerved, bordered with a nerve-like thickening along the entire margins; flowers greenish white, fragrant, on long, slender, glabrous, jointed pedicels, by 3-6 in a small umbel, on a slender glabrous peduncle bearing below its middle 2 white, thin-chartaceous, laxly-veined, ovate-oblong, glabrous floral leaves, the umbellets often forming a brachiate panicle at the end of the branchlets; perianth glabrous outside, 4 to nearly 5 lin. long, the lobes linear, very long; perianth-scales 10, club-shaped; nut spheroid-obovate, the size of a large pea, appressed pilose, carrying at its side the remains of the thin perianth.

Hab.—Chittagong; Tenasserim.

3. **L. scandens,** Kz.—A leaf-shedding (?), meagre shrub, with alternately distichous branches; leaves oblong to oval, on a 2½ to 3 lin. long tawny-tomentose petiole, acute or more usually rounded with a mucro, 3-4 in. long, obtuse or rounded at the base, chartaceous, with thickened entire borders, indistinctly wrinkled and glabrescent above, beneath densely tawny-tomentose, parallel-nerved with transverse veination; flowers on very short tomentose pedicels, forming densely tawny-tomentose few-flowered umbellets at the

end of a long peduncle furnished below its middle with 2 floral leaves, the latter reflexed, with the upper side downwards, elliptically oblong and somewhat retuse, minutely pubescent, strongly nerved and transversely veined, above (below) glossy, beneath (above) opaque, on a very short thick tomentose petiole inserted with a broad base to the knob-like thickening of the peduncle; perianth glabrous (?); nut ovate, the size of a large pea, glabrescent.

HAB.—Tenasserim.

4. **L. Siamense,** Kz.—A leaf-shedding (?), meagre, erect shrub, the younger parts all shortly tawny-tomentose; leaves oblong to oval-oblong and elliptical, 4-5 in. long, on a 2-3 lin. long shortly tomentose petiole, more or less acute or rounded at the base, blunt or rarely almost notched with a mucro, entire, coriaceous, above glabrous or sparingly and shortly tomentose on the nerves, beneath shortly tawny-tomentose, the lateral nerves parallel and rather crowded; flowers unknown, but the umbellets forming shortly tawny-tomentose lax panicles at the end of the branchlets; floral leaves opposite or nearly so, rarely alternate, chartaceous, elliptically oblong or ovate-oblong, 1-1½ in. long, puberulous, especially on the nerves, which are prominent on both sides, blunt, on a very short pubescent petiole not thickened at its insertion; drupes oval, blackish, sparingly appressed hairy, enclosed in the chartaceous shortly tomentose glabrescent perianth crowned with the densely tawny-tomentose perianth-lobes.

HAB.—Not unfrequent in the Eng forests of the Prome district.—l.—SS.= Lat.

AQUILARIA, Lam.

Perianth coriaceous, bell-shaped, 5-cleft; scales at the throat 10, exserted, pilose, united at the base and forming a 10-crenate or lobed crown. Stamens 10, adnate to the perianth-tube. Hypogynous scales or ring none. Ovary sessile, solitary, or by 2, if solitary with 2 cells and if by pairs 1-celled; style none or long, with a convex or 2-cleft stigma. Capsule woody, with a thin-coriaceous pericarp, obovate, cuneately narrowed at the base, but sessile, 2-valved, the valves bearing the placentas on their middle. Seeds 2, or more usually solitary from abortion. Albumen none. Embryo inversed.—Trees or shrubs, with alternate silky-glossy leaves. Flowers in poor axillary and terminal umbels, or few together clustered.

Capsules wrinkled, softly and densely tomentose . . . . *A. Agallocha.*
Capsules smooth and glabrous . . . . . *A. Malaccensis.*

1. **A. Agallocha,** Roxb.—An evergreen large tree, the young shoots pilose; leaves linear-lanceolate to lanceolate and obovate-

oblong, on a line long petiole, acute or rounded at the base, 2-3½ in. long, caudate-acuminate, thin-chartaceous, slightly appressed-pilose on the nerves beneath or glabrous, silky-glossy, faintly parallel-nerved; flowers rather small, greenish, on very slender pilose pedicels 2-3 lin. long or longer, forming sessile or shortly peduncled umbels arising laterally from the younger branchlets; perianth 2½ lin. long, slightly hairy outside, densely villous inside, especially the lobes; perianth-scales oblong, villous, alternating with the stamens and as long; filaments red at apex; ovary tawny-tomentose; capsules obovate-cuneate, slightly compressed, about an inch long, densely tawny or yellowish tomentose, in a dried state shrivelled and wrinkled.

Hab.—Martaban hills east of Tounghoo.

Remarks.—Wood very light, yellowish white, coarse-fibrous, but close-grained, takes a pale-brown polish. Used by the Karens for bows. Furnishes that sort of commercial Eagle-wood called by the Malays *Kayu garu.*

2. **A. Malaccensis,** Lamk.—An evergreen tree, the young shoots appressed pilose; leaves oblong-lanceolate to oblong, on a pubescent glabrescent petiole 1-2 lin. long, obtuse at the base, 2½-4 in. long, acuminate, chartaceous, silky-glossy, glabrous, or beneath sparingly pilose (especially while young); flowers small, on about 2 lin. long pedicels, in short puberulous umbels, nodding; perianth glabrous outside, greyish velvety within; capsules compressed-obovate, tapering at the base, 2-valved, woody, smooth and glabrous.

Hab.—Burma, probably Tenasserim.

EUPHORBIACEÆ.

Flowers unisexual. Calyx free, various, usually 5- or 3-lobed or -toothed, or wanting, the lobes imbricate or valvate. Corolla consisting of several petals and usually isomerous with the calyx-lobes and alternating with them, or very rarely gamopetalous, hypogynous or more or less perigynous, or wanting altogether. Disk variously shaped or none. Stamens numerous, few or solitary, in the male flowers central or inserted at the bottom or at the middle of the calyx; filaments free or united into 1 or more bundles, erect or variously incurved; anthers free or cohering, variously opening by 2 or 1 slit, rarely by pores. Ovary-rudiment in males various or wanting. Ovary superior, usually 3- or 1-many-celled, the carpels whorled round a central column persisting after ripening of the fruit, with 1 or 2 ovules in each suspended from the summit of the inner angle; style various, usually short and divided into as many entire or repeatedly branched stigmatic lobes as cells to the ovary. Fruit various, usually a 3- to many-celled capsule opening elastically into as many valves, or drupaceous and indehiscent.

Seeds with or without arillus or strophiole. Embryo straight in a fleshy albumen, with flat cotyledons and a superior radicle, or rarely the cotyledons fleshy, and little or no albumen.—Trees, shrubs, or herbs, erect or climbing, very various in habit, with watery or milky juice. Leaves usually alternate, rarely opposite or whorled, simple or divided. Stipules usually present. Flowers usually minute, forming various inflorescences.

A very large order more closely allied to *Tiliaceæ* than to any order amongst the apetals. Upwards of 156 species occur in Burma, the greater part of which are woody. Venenous principles prevail and reside chiefly in their milky juice. The seeds of some are purgative, and the roots of others emetic. The manchineel (*Hippomane mancinella*) is a famous poison. Euphorbium, a gum-resin, is produced by several cactus-like *Euphorbias*. Some of the African species of this genus yield deadly arrow-poison. The Brazilian caoutchouk (*Siphonia elastica* = *Hevea Guyanensis*), a tree indigenous in Guayana and Brazil, yields the bottle India-rubber. The seeds of many species yield oil, like castor-oil (*Ricinus*). The sweet and bitter cassava, derived from the roots of *Manihot utilissima*, is often cultivated by Burmans. Turnsole, a well-known purple and blue dye, comes from *Crozophora tinctoria*. A few yield edible but inferior fruits, like *Cicca disticha*, *Emblica officinalis*, etc. Box-wood (*Buxus sempervirens*) is a very hard and compact wood used in engraving. Several of the Burmese euphorbiaceous trees yield good timber, especially those growing in deciduous forests, while the timber of those peculiar to the tropical forests seems to be of inferior quality or valueless.

* *Ovules 2 in each cell.*
× Calyx imbricate in bud.
○ Fruit more or less readily capsular-dehiscing, dry or with a fleshy or sappy epicarp; petals none.
† Capsule dry.
+ Stamens round an ovary-rudiment.
Styles free; seeds naked; capsule woody or dry-coriaceous . . *Actephila.*
++ Stamens central; no ovary-rudiment.
Capsule 20-3-coccous; styles simple, more or less connate; hypogynous glands or disk none; testa of seeds arillus-like, fleshy or sappy, usually scarlet . . . . . *Glochidion.*
Capsules usually 3-coccous; styles 2-cleft; hypogynous glands or disk present; testa of seeds dry . . . . . *Phyllanthus.*
†† Capsules fleshy-coriaceous or more usually crustaceous with a fleshy or sappy epicarp.
+ Stamens central; no ovary-rudiment.
† Seeds with arillus.
Style 2-cleft; calyx of both sexes turbinate, high up connate . *Melanthesopsis.*
†† Seeds without arillus.
Capsules fleshy-leathery; male calyx deeply 6-cleft . . . *Sauropus.*
Male calyx turbinate, high up connate; style entire . . . *Breynia.*
Capsule drupaceous, the capsular putamen woody or crustaceous, 6-3-coccous; stamens free or connate . . . . . *Cicca.*
++ Stamens round an ovary-rudiment.

‡ Flowers in axillary clusters.

Flowers 5-merous; stamens 5, free; disk 5-angular-annular; capsule with a (usually white) fleshy epicarp, 3- or by abortion 2-coccous . . . . . *Securinega.*

‡‡ Flowers racemose-panicled.

Stamens 5, free; albumen scanty; trees with 3-foliolate leaves . *Bischoffia.*

○○ Fruit indehiscent, drupaceous or berry-like, when over-ripe sometimes irregularly bursting but not truly dehiscent.

+ Flowers in racemes or spikes, the males often amentaceous; stamens free, round an ovary-rudiment.

‡ Seeds with an arillus.

Ovary 3-celled; capsule fleshy-coriaceous, sometimes irregularly bursting when over-ripe . . . . . *Baccaurea.*

‡‡ Seeds without arillus.

Ovary 1-celled; drupe sappy, the bony putamen 1-seeded . . *Antidesma.*

Ovary 2-celled; drupe fleshy-coriaceous, by abortion usually 1- or rarely 2-seeded . . . . . *Aporosa.*

++ Flowers solitary or clustered in the axils of the leaves.

Ovary 4-2-celled; stamens 4-40, free; drupe fleshy, with a thin 4-2-celled endocarp . . . . . *Cyclostemon.*

Ovary 1-celled; stamens 8-25, free; drupe fleshy, with a bony 1-celled endocarp . . . . . *Hemicyclia.*

Ovary 3-or 2-celled; stamens 3-2, free or connate; drupe with a bony 1-celled putamen . . . . . *Putranjiva.*

×× Calyx valvate in bud; fruit capsular, fleshy or dry; flowers in axillary clusters, the clusters arranged sometimes in spurious racemes or spikes.

Capsules with a fleshy epicarp, sessile, the cocci separating; testa of seeds dry . . . . . *Briedelia.*

Capsules dry, sessile or stalked . . . . . *Cleistanthus.*

∗∗ *Ovules solitary in each cell.*

× Calyx valvate in bud (rarely the sepals very slightly imbricate at their tips).

+ Petals present, more or less developed or if suppressed, the hypogynous glands opposite the calyx-segments.

○ Stamens in bud infracted or incurved.

Flowers in racemes or spikes; seeds with spermaphore . . . *Croton.*

○○ Stamens in bud erect.

† Petals in males as many as calyx-segments; ovary-rudiment none; stamens central.

Anthers basifix; seeds arillate; flowers racemose . . . . *Sumbavia.*

†† Calyx regularly valvate in bud; male flowers with twice as many petals; ovary-rudiment none; stamens central.

Flowers in bracted amentaceous spikes . . . . . *Agrostistachys.*

††† Calyx irregularly bursting in 2 or 3 lobes; petals (at least in the males) more than calyx-segments; ovary-rudiment none; stamens central.

Flowers in terminal panicles; seeds arillate; capsule drupaceous . *Aleurites.*

++ No petals.

○ Stamens round an ovary-rudiment.

Flowers in terminal panicles . . . . . *Symphyllia.*

○○ Ovary-rudiment none; stamens central or round a central disk, not polyadelphous.

‡ Flower dioecious.
§ Capsule drupaceous.
Flowers in axillary racemes; seeds with arillus . . . . *Trewia.*
§ § Capsule dry.
|| Seeds without arillus or spermaphore.
Female calyx flask-shaped, irregularly bursting; anthers 2-celled; flowers racemose . . . . . *Mallotus.*
Calyx deeply divided; anthers 2-celled; flowers racemose . . *Alchornea.*
Calyx deeply divided; anthers 3-4-celled; flowers panicled or racemose . . . . . *Macaranga.*
Calyx deeply divided; anthers 4-celled; male flowers racemose, females solitary . . . . . *Cleidion.*
|| || Seeds with an arillus or spermaphore.
Seeds arillate; capsules large, woody; flowers in racemes . . *Blumeodendron.*
Seeds arillate; stamens numerous; flower-buds usually apiculate; flowers in short bracted racemes or spikes, or clustered; capsules not compressed or appendaged . . . . . *Coelodiscus.*
Seeds with spermaphore; capsules 2-celled and samaroid-compressed; male flowers amentaceous; females in short racemes or solitary . . . . . *Hymenocardia.*
Seeds arillate; capsules not compressed or appendaged; flowers in spikes . . . . . *Claoxylon.*
‡ ‡ Flowers monoecious.
Seeds with spermaphore; anther-cells almost serpentine, the connective not produced; flowers racemose or spicate; erect herbs or shrubs . . . . . *Acalypha.*
Seeds without spermaphore or arillus; connective of anthers not produced; flowers racemose; erect or twining shrubs . . *Tragia.*
Seeds arillate; connective long produced beyond the cells; flowers racemose; twining shrubs . . . . . *Cnesmone.*
Seeds without spermaphore or arillus; flower-heads enclosed in a large 2-leaved involucre; twining shrubs . . . . *Dalechampia.*
○ ○ ○ Ovary-rudiment none; stamens central, polyadelphous.
Monoecious; seeds with spermaphore; flowers racemose . . *Ricinus.*
Dioecious; seeds with a fleshy sappy testa; flowers racemose or spicate, or the females solitary . . . . . *Homonoya.*
× × Calyx imbricate in bud (or sometimes wanting).
○ Petals present, or if suppressed, the hypogynous glands opposite the calyx-segments.
+ Fruit capsular, dry.
† Flowers in terminal or axillary panicles.
Stamens inserted round an intrastaminal disk; seeds with spermaphore . . . . . *Manihot.*
Stamens central; seeds with spermaphore . . . . . *Jatropha.*
Stamens numerous, on a convex central receptacle; capsule woody; seeds naked . . . . . *Ostodes.*
† † Flowers in elongate or umbel-like racemes.
Seeds with spermaphore; stamens central, on an elevated receptacle . . . . . *Codiæum.*
Seeds without spermaphore; stamens central, on a flat receptacle . *Trigonostemon.*
+ + Fruit a drupe, indehiscent.
† Flowers in racemes.
Petals induplicate, almost valvate; stamens round an ovary-rudiment . . . . . *Galearia.*
† † Flowers clustered.
Petals flat, imbricate; stamens round an ovary-rudiment . . *Microdesmis.*
○ ○ Petals absent.
+ Flowers not enclosed in an involucre.

† Flowers clustered, or the clusters arranged in racemes or rarely panicled.

Stamens round an ovary-rudiment; seeds arillate at base; capsules woody coriaceous . . . . . *Chætocarpus.*

Stamens central; no ovary-rudiment; seeds naked; capsules fleshy-leathery . . . . . *Gelonium.*

Stamens central; no ovary-rudiment; seeds arillate at base; capsules dry, crustaceous . . . . . *Baliospermum.*

†† Flowers in racemes or spikes, sometimes amentaceous.

Capsule with a more or less fleshy or sappy epicarp, dehiscent; seeds arillate; trees or shrubs . . . . . *Carumbium.*

Capsule dry, woody or crustaceous; seed naked; trees or shrubs. *Excœcaria.*

++ Flowers clustered, enclosed in a calyx-like more or less turbinate, bell-shaped or slipper-shaped involucre.

Involucre bell-shaped or turbinate, bearing glands between the lobes . . . . . *Euphorbia.*

Involucre regularly slipper-shaped and 2-lipped, or irregularly so with an appendage on the back, the glands situated on the bottom of the upper lip, or entirely wanting . . . . *Pedilanthus.*

ACTEPHILA, Bl.

Calyx-lobes of male flowers 5 or rarely 6, imbricate. Petals 5 or 6, alternating with the calyx-lobes. Disk outside the stamens, in the females perigynous and more or less high up adnate to the calyx. Stamens inserted on a flat 5-lobed receptacle round the base of the ovary-rudiment; filaments free or united at the base; anthers opening by 2 slits, the cells longitudinally adnate. Ovary 3-celled, the cells 2-ovuled; styles 3, united at the base, the branches 2-cleft. Capsule 3-coccous, the cocci 2-valved. Seeds without an arillus. Albumen none.—Monoecious or dioecious shrubs, with alternate simple leaves and sharply cornered petioles. Female flowers solitary and long-pedicelled, male flowers in 3-5-flowered clusters in the axils of the leaves, or the male and female ones mixed. Capsules large, on an elongate pedicel thickened upwards.

All parts quite glabrous; leaves acute to cuneate at the base; capsules smooth . . . . . *A. Javanica.*

Young branchlets and petioles puberulous; leaves rounded or cordate at the base; capsules granular-wrinkled . . . *A. puberula.*

1. **A. Javanica,** Miq.—An evergreen shrub, all parts glabrous; stipules linear-lanceolate, very deciduous; leaves from elliptically obovate to obovate and oblong, acute or obtuse to almost cuneate at the base, on a glabrous petiole varying in length from 2 lin. to 1¼ in., shortly acuminate, 3-6 in. long, entire or waved, thin-coriaceous, quite glabrous, drying blackish or pale-brownish; male flowers orange-red; calyx coriaceous; petals cuneate-obovate; capsules the size of a cherry, smooth, on a 1-1½ in. long, glabrous

peduncle thickened upwards and arising singly from the axils of the leaves or from amongst the male flowers.

Hab.—Frequent in the tropical forests of South Andaman.—Fr. Apr.-May. —s.—SS.=SiS.

2. **A. puberula,** Kz.—An evergreen shrub, 4-8 ft. high, the young branchlets minutely puberulous; stipules short, ovate, very deciduous; leaves elliptically- to obovate-oblong, rounded or almost cordate at the base, on a puberulous glabrescent petiole ½-1⅓ in. long, bluntish acuminate, 4-7 in. long, entire, chartaceous or thick-membranous, glabrous above, beneath minutely pubescent along the nerves and glabrescent, in drying turning yellowish green; flowers orange-coloured, monoecious or dioecious, axillary; calyx coriaceous; capsules the size of a cherry, granular-wrinkled, on a ½-2 in. long, glabrous peduncle thickened upwards and arising solitary from the axils of the leaves.

Hab.—Frequent in the tropical and moister upper mixed forests of the Andamans.—Fl. Fr. May-June.—s.—SS.=SiS., etc.

GLOCHIDION, Forst.

Flowers monoecious. Calyx 6- or 5-parted or -lobed, imbricate. Glands none. Males: stamens 3 to 5, or rarely more; anthers oblong, sessile, on a central column, tipped by the projecting connective. Females: ovary 3-15-celled, with 2 ovules in each cell; styles variously united in a style-column, which is conical, obconical, globular or almost funnel-shaped, the stamens free and tooth-like or reduced to tubercles. Capsule globular or depressed-globular, more or less lobed, 3-15-celled and opening into as many 2-valved cocci, the epicarp usually separating elastically. Seeds with an usually crimson spurious arillus, by pairs.—Trees or shrubs, with more or less distichous simple leaves. Stipules small; flowers in axillary clusters or fascicles.

* *Stamens* 5 (*rarely* 8-4).

○ *Ovary, and often also the capsule, pubescent or villous; female flowers sessile or nearly so.*

Young branchlets, calyx, and pedicels puberulous or pubescent; style-column conical; capsule 8-12-celled, fleshy-coriaceous, white, or with scarlet hue . . . . . *G. coccineum.*

All parts, also calyx and pedicels, quite glabrous; style-column cylindrically conical, at top 6-8-toothed; capsules glabrous, 6-8-celled . . . . . *G. lanceolarium.*

○○ *Ovary and capsule glabrous; female flowers more or less pedicelled.*

Style-column conical, 4-5-stigmatic at the apex; capsule 5-4-coccous *G. calocarpum.*

Style-column minute, deplanate-conical with a broad base; capsule 10-15-celled, fleshy-coriaceous . . . . . *G. multiloculare.*

Style long, funnel-shaped-clavate; capsules 4-3-coccous . . *G. subscandens.*

** *Stamens* 3.

× *Styles more or less funnel-shaped or at least tapering at base, the stigmas short and tubercle-like.*

All parts, also the calyx, quite glabrous; flowers of both sexes sessile; capsule glabrous . . . . . *G. Daltoni.*

Young parts and leaves beneath, as also the flowers, more or less puberulous; flowers of both sexes pedicelled; capsules puberulous . . . . . *G. Nepalense.*

×× *Style equal, shorter or longer, the stigmas linear, more or less spreading; capsules usually* 3-6-*coccous.*

Young shoots and also the flowers pubescent; capsules on capillary peduncles up to ½ an in. long, pubescent; stigmas pubescent . *G. dasystylum.*

As former, but peduncle of capsule very short or almost wanting; styles glabrous . . . . . *G. leiostylum.*

××× *Style thick, conical, sometimes minute, or hemispherical.*

○ *Ovary and capsule glabrous.*

All parts glabrous; capsules flat, depressed at top, 3-4-coccous, smooth, almost pruinous, very short-peduncled; style-column minute . . . . . *G. glaucifolium.*

All parts glabrous; capsules sessile, 6-4-coccous, depressed-globular, but not flattened at top . . . . . *G. fagifolium.*

All parts quite glabrous; style-column almost spherical and minute, constricted at base; capsules very short-peduncled, glabrous, depressed-globular . . . . . *G. sphærogynum.*

○○ *Ovary and capsule more or less puberulous to tomentose.*

All parts quite glabrous; leaves glaucous beneath; capsules almost sessile, velvety, 6-4-coccous . . . . . *G. Andamanicum.*

All softer parts and leaves beneath shortly tomentose; capsules peduncled, 5-4-coccous, puberulous . . . . . *G. Bancanum.*

∗ *Stamens* 5 (*rarely* 8-4).

1. **G. coccineum,** Muell. Arg.—*Ta-ma-soke*, like all other species of the genus.—An evergreen tree (25—30 + 2—3 + 2—3), or remaining shrubby, the young shoots shortly pubescent and the branchlets often tawny puberulous and more or less angular; bark about 2-3 lin. thick, brownish grey, rather fibrous, longitudinally and narrowly fissured; cut red; leaves oblong to elliptically oblong, rounded or obtuse at the base, on a 1-1½ lin. long petiole, apiculate or shortly and bluntish acuminate, 3-4 in. long, chartaceous or almost coriaceous, glabrous, while very young slightly pubescent, usually purplish green beneath; flowers small, clustered, greenish, the males long and slender-pedicelled, the females sessile; anthers usually 5 or more; ovary about 8-12-celled, densely silky-pubescent; style-column conical; capsules depressed-globular, concave on both ends, white and often purplish tinted, fleshy-coriaceous, 8-12-celled and 16-24-sulcate, up to nearly an inch in diameter, slightly and sparingly pilose or almost glabrous; arillus bright scarlet.

Hab.—Frequent in all leaf-shedding forests, especially the mixed ones, from Prome and Martaban down to Tenasserim.—Fl. March-Apr.; Fr. C.S.—l.—SS. = ∞ *SiS. All.*

Remarks.—Wood yellowish white.

2. **G. lanceolarium,** Dalz.; Bedd. Sylv. Madr., 192 (*Phyllanthus lanceolarius,* Muell. Arg.; Brand. For. Fl., 453).—An evergreen tree (25—30+8—12+2—3), all parts glabrous, the branchlets somewhat angular; leaves elliptical to elliptically lanceolate, acute at the base, on a strong petiole 1-2 lin. long, shortly acuminate, 3-4 in. long, rigidly coriaceous, glabrous, uniformly green, glossy above; flowers rather small, glabrous, clustered in the axils of the leaves, the males on long, slender, glabrous pedicels, the females sessile or nearly so; male perianth 6-parted; anthers 4-6; ovary 8-6-celled, silky-pubescent, gradually narrowed into the cylindrically conical style-column, 6-8-toothed at the top; capsules depressed-globular, slightly concave on both ends, 6-8-lobed, smooth, about ½ in. in diameter; arillus red.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah; also Chittagong.—Fl. Fr. Feb.-March.—s.—SS. =SiS. Metam.

Remarks.—Wood hard and durable, used in native house-building.

3. **G. calocarpum,** Kz.—An evergreen small tree (20—25+6—8+1—½), all parts quite glabrous; leaves somewhat oblique, ovate to ovate-oblong, rounded at the base, on a strong petiole about 3 lin. long, bluntish and shortly acuminate or apiculate, mucronate, thin-coriaceous, glabrous, glossy, 4-6 in. long; flowers pedicelled, fascicled; the females on 1½-2 lin. long pedicels; calyx 5-parted, the segments ovate, acute, ½ lin. long, glabrous; ovary glabrous narrowed into a conical style-column 4-5-stigmatic at the top; the male flowers on capillary pedicels 3-4 lin. long; calyx 6-parted, the segments linear-oblong, recurved, a line long; anthers 6, rarely 6 or 4; capsules on a 2-3 lin. long peduncle, depressed, about ½ in. across, usually 5- or by abortion 4-celled and 10-8-lobed, quite smooth and glabrous, purple-coloured, crowned by the conical style-column which is depressed at the top.

Hab.—In the beach forests of the Andamans.—Fl. Fr. Feb.-March.—l.—SS.=Aren. Ca.

4. **G. multiloculare,** Muell. Arg.—An evergreen tree (20+6—8+¾—1), all parts glabrous, the branchlets sharply angular; leaves oblong to obovate-oblong, acute at the base, on a petiole hardly a line long, 2-3 in. long, blunt or bluntish with a mucro, chartaceous, glabrous, glaucous beneath and elegantly (in a dried state blackish) nerved and transversely veined; flowers small, both sexes on short pedicels 1-2 lin. long, clustered in the axils of the leaves; male perianth 6-parted, glabrous; anthers usually 5; female perianth 6- or more-parted, glabrous; ovary 10-15-celled, glabrous, the style-column minute, deplanate-conical from a broad base; capsules depressed-globular, concave at both ends, shortly peduncled, up to

nearly an inch in diameter, 10-15-celled and -lobed; arillus bright red.

Hab.—Ava, near Bhamo.

5. **G. subscandens,** Zoll.—An evergreen shrub, all parts quite glabrous, the branchlets compressed-angular; leaves oblong-lanceolate to ovate-oblong, on a glabrous petiole 1-2 lin. long, often somewhat unequal, 2½-5 in. long, bluntish acuminate, chartaceous, glabrous, in a dried state of a uniform fuscous colour; flowers small, clustered in the axils of the leaves, the females on rather short and thick glabrous pedicels, the males on longer ones; perianth-lobes of females lanceolate, rather blunt, nearly a line long; ovary glabrous; style long, exserted, clavate-funnel-shaped; male perianth glabrous; stamens 5; capsules depressed-globular, glabrous, about ½ to ¾ in. in diameter, usually 4-3-coccous.

Hab.—Tenasserim.

* * *Stamens* 3 *only.*

6. **G. Daltoni,** Kz.; Bedd. Sylv. Madr., 195.—A leaf-shedding small tree or shrub, all parts quite glabrous; leaves lanceolate to oblong-lanceolate, slightly oblique, acute at the base, on a 1-2 lin. long petiole, acuminate, when full-grown thin but rigidly coriaceous, quite glabrous, glossy, turning brown in drying; flowers small, glabrous, clustered in the axils of the leaves, the males pedicelled, the females sessile; calyx glabrous; anthers 3; ovary villous, the style-column as broad as the ovary, funnel-shaped-thickened, with 5 stigmatic callosities; capsules about ½-¾ in. in diameter, 4-5-coccous and 8-10-sulcate, depressed-globular, glabrous.

Hab.—Not unfrequent in the low and dry forests of the Prome district; also Upper Tenasserim.—Fl. March.—l.—SS.=*Aren. Dil.* Metam.

7. **G. Nepalense,** Kz.—A shrub, the young shoots pubescent; leaves oblong to elliptically oblong, shortly acuminate to almost blunt, on a line long pubescent petiole, 2-2½ in. long, chartaceous, while young, especially beneath, shortly and laxly pubescent, glabrescent above; flowers small, pubescent, clustered in the axils of the leaves or above the scars of the fallen ones, the males on long, slender, the females on short tomentose pedicels; calyx-lobes of males oblong-lanceolate; anthers 3; ovary whitish villous, the style-column thick and shortly funnel-shaped, hardly constricted at the middle, with 5 glabrous stigmatic callosities; capsules unknown.

Hab.—Burma, probably Ava.

8. **G. dasystylum,** Kz.—An evergreen tree (15—20+short+1—1½), all softer parts pubescent, and the almost terete branchlets

hirsute from spreading rusty- or tawny-coloured hairs; bark grey, narrowly and longitudinally fissured; leaves ovate, a little oblique, on a line long tomentose petiole, sharply acuminate, rounded or obtuse at the base, 2-3 in. long, chartaceous, softly pubescent, when full-grown turning shortly and minutely puberulous above; female flowers fascicled or almost umbellate; capsules on very slender pilose peduncles up to ½ in. long, depressed-globular, about ¼ in. in diameter, 3-celled and 6-lobed, pilose from white spreading hairs; style-column in fruit short, 3-cleft, the lobes linear, simple, spreading, pubescent; arillus red.

Hab.—Not unfrequent in the tropical forests of Martaban east of Tounghoo, ascending into the drier hill forests up to 3,500 ft. elevation.—Fr. March-Apr.—s.—SS.=Metam.

9. **G. leiostylum,** Kz.—An evergreen shrub, growing out into a small tree, the young parts and slightly angular branchlets pubescent; leaves obliquely ovate to oblong-ovate, on a pubescent petiole about a line long, acute or obtuse at the unequal base, longer or shorter and often bluntish acuminate with a mucro, 2-3½ in. long, chartaceous, above (except on the midrib) glabrous, beneath, especially along the nerves, shortly pubescent; flowers minute, clustered, the males on long, slender, pubescent pedicels, the females sessile or nearly so; male calyx usually 5-cleft, the lobes lanceolate, acute; stamens 3; female calyx 5-parted, slightly pubescent, the segments linear-lanceolate, acuminate; ovary villous, the style-column conical, tapering upwards and 3-cleft, quite smooth; capsules the size and shape of those of the preceding species, sessile, or on stiff peduncles 1-1½ lin. long, depressed-globular, about ¼ in. in diameter, 3-celled and 6-lobed, shortly pilose; arillus red.

Hab.—Rather frequent in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim, ascending into the hill forests up to 4,000 ft. elevation.—Fl. Apr.—s.—SS.=*Metam.* SiS.

10. **G. glaucifolium,** Muell. Arg.—An evergreen small tree or shrub, all parts quite glabrous; leaves oblique, elliptical to elliptically ovate, on a rather slender petiole 1 to 2 lin. long, rounded at the broader, acute at the narrower side of the base, 1½-2½ in. long, apiculate, chartaceous, smooth, glaucous beneath; flowers minute, both sexes very shortly and strongly pedicelled, or the females almost sessile, clustered in the axils of the leaves; calyx of both sexes smooth, the lobes elliptical, blunt; stamens 3; style short, narrow and minute; capsule depressed-turbinate, about ⅓-¼ in. in diameter, much flattened at the top, bluntish, 4-3-cornered, smooth and sometimes a little pruinous.

Hab.—Upper Tenasserim.—Fl. Fr. March-Apr.

11. **G. fagifolium,** Kz.; Bedd. Sylv. Madr., 193.—An evergreen

tree (20—25+short+1—1½), all parts quite glabrous, or the young angular branchlets sprinkled with a few bristles; leaves lanceolate, sometimes somewhat falcate, acute at the base, on a strong 2-3 lin. long petiole, acuminate, thin-coriaceous, quite glabrous, glossy, in a dried state brownish; flowers small, glabrous, clustered in the axils of the leaves or above the scars of the fallen ones, the males on long and slender, the females on very short and thick pedicels, or almost sessile; calyx-lobes of males broadly ovate, blunt, those of the females short, ovate, acute; ovary glabrous, the style-column almost conical, thick, short, usually 5-tubercled at the top; stamens 3; capsules 6-4-coccous, depressed-globular, smooth.

Hab.—Frequent in the tropical forests along the eastern slopes of the Pegu Yomah and in Martaban; also Chittagong.—Fl. March-Apr.; Fr. June.—s.—SS.=SiS. Metam.

12. **G. sphærogynum,** Kz.—An evergreen tree (25—30+8—10+2—3), all parts quite glabrous; bark ⅓ in. thick, fibrous; cut red; leaves lanceolate to ovate-lanceolate, acute at the base, on a 2-3 lin. long petiole, long-acuminate, 3-4 in. long, thin-coriaceous, smooth, somewhat purplish green beneath; flowers small, clustered in the axils of the leaves, the males on long, rather stiff but slender pedicels, the females on very short and strong ones; calyx glabrous, the lobes of the males oblong-ovate, blunt; stamens 3; ovary glabrous, the style-column almost spherical and minute, constricted round the base; capsules rather small, depressed-globular, glabrous; arillus red.

Hab.—Frequent in the tropical forests along the eastern slopes of the Pegu Yomah and from the Martaban hills down to Tenasserim, up to 2,000 ft. elevation.—Fl. Feb.-March; Fr. C.S.—s.—SS.=Metam. SiS.

Remarks.—Wood brown, heavy, fibrous, but close-grained, soft, perishable.

13. **G. Andamanicum,** Kz.—An evergreen tree (25+8—10+1—1½), all parts quite glabrous, the branchlets angular, compressed; leaves elliptical to elliptically oblong, the lower ones often smaller and almost orbicular-elliptical, acute or obtuse at the base, on a 1½-2½ lin. long petiole, blunt to bluntish acuminate, 2-3 in. long, thin-coriaceous, quite smooth, glaucescent beneath; flowers small, clustered in the axils of the leaves, the females sessile, the males on slender minutely puberulous pedicels; calyx minutely puberulous, the lobes in the males oblong, blunt; stamens 3; ovary villous-tomentose, the style-column thick and conical, nearly as broad as the ovary itself, truncate, with 5 or 6 tubercle-like stigmas; capsules 6-4-coccous, depressed-globular, concave at both ends, 12-8-sulcate, more than ½ an inch in diameter, greyish puberulous; seeds red, glossy.

Hab.—South Andaman, in tropical forests rather rare.—Fl. Fr. Apr.-May —s.—SS.—SiS.

14. **G. Bancanum,** Miq.—An evergreen tree (20—25 + 8—10 + 1—1½), the young shoots covered with a tawny hirsute tomentum; leaves oblong to elliptically oblong, more or less unequal or almost equal, acute or rounded at the base, on a strong tomentose petiole 1-2 lin. long, shortly acuminate, 3-5 in. long, above minutely pubescent and glabrescent, beneath tawny-velvety-pubescent; female flowers small, tawny-pubescent, on short and robust pedicels clustered in the axils of the leaves; female calyx 6-parted, the lobes linear-lanceolate; ovary and style-column shortly tomentose, the latter almost equal, strong, as long as the ovary, with 5 glabrous, short, blunt stigmas; capsules usually 5- or 4-coccous, depressed-globular, while young tomentose, adult minutely puberulous, about ⅓ in. in diameter.

HAB.—In bamboo jungles of Middle Andaman.—Fr. Apr.—s.—SS.=chloritic rocks.

PHYLLANTHUS, L.

Flowers monoecious or rarely dioecious. Calyx 4-6-parted, the lobes in 1 or 2 series, imbricate. Disk prominent, entire or lobed, or consisting of small distinct glands. Males: stamens 3, rarely 2 or 5, united in a central column or free. Females: ovary 3-celled, with 2 ovules in each cell; styles free or united at the base, more or less 2-lobed. Capsule dry, separating into three 2-valved cocci or dehiscing loculicidally. Arillus none.—Herbs or shrubs, rarely trees, with alternate usually distichous simple leaves and small usually persistent stipules. Flowers small, in axillary clusters, solitary, or in terminal spurious racemes.

* *Trees, capsules more or less woody.*

Young shoots shortly rusty-pubescent; flowers in axillary clusters . . . . . *P. columnaris.*

Quite glabrous; flowers clustered, forming elongate, slender, axillary racemes . . . . . *P. bæobotryoides.*

* * *Shrubs or undershrubs; capsules small, crustaceous.*

Glabrous; leaves small, blunt; flowers solitary, axillary; capsules smooth . . . . . *Ph. parvifolius.*

1. **P. columnaris,** Muell. Arg.—*Kalong-lek-thai.*—A tree (20—25 + 10—12 + 1—2½), shedding leaves in H.S., the young shoots shortly pubescent; leaves small, oblong to elliptically oblong, rounded or obtuse at the base, on a slender puberulous petiole about a line long, acute or bluntish, 1-2 in. long, chartaceous, glaucous beneath, glabrous, or minutely puberulous beneath, especially along the midrib; flowers minute, the females on short and rather robust, the males on capillary, but also rather short pedicels, glabrous or fugaceously brown pilose, clustered in the axils of the leaves or along the rather slender leafless branchlets and appearing interruptly glomerate-racemose; female calyx 6-parted; hypogynous disk urceolate,

entire or minutely toothed; stamens 3, on a slender exserted column nearly 3 times longer than the calyx; ovary glabrous, the style-column slender, 3-cleft at the top, the lobes 2-lobed; capsules on a 3-4 lin. long puberulous peduncle, depressed-globular, 3-coccous and 3-lobed, about $\frac{1}{3}$ in. in diameter, glabrous, woody coriaceous.

Hab.—Frequent in the mixed forests, chiefly in the lower ones, especially along choungs; also in the open forests; all over Burma from Pegu and Martaban down to Tenasserim.—Fl. R.S.; Fr. C.S.—l.—SS.=All. SiS. *Dil.*

2. **Ph. bæobotryoides,** Muell. Arg.—An evergreen shrub (?) or small tree (?), all parts quite glabrous, the branchlets sharply compressed-4-cornered; leaves ovate-oblong to ovate-lanceolate, on a strong petiole up to a line long, obtuse or rounded at the base, 2-4 in. long, long-acuminate, chartaceous or thin-coriaceous, glabrous; flowers glabrous, on very short but filiform smooth pedicels, the females sessile, clustered, and forming filiform, smooth, interrupted racemes (often very elongated) in the axils of the leaves and in the forks of the branchings; calyx-lobes oblong-ovate, the hypogynous glands of the males free and obovoid-3-cornered, those of the females almost free and narrow or united and urceolate; staminal column very short, the anthers shortly apiculate; style-column as long as the ovary, the free styles 2-parted, recurved and spreading.

Hab.—Tenasserim.

MELANTHESOPSIS, Muell. Arg.

Flowers monoecious. Male calyx high up gamosepalous, turbinate, the 6 lobes in 2 series and inflexed, imbricate. Female calyx usually enlarged under the fruit. Petals none. Disk none. Stamens central, united in a column, the cells longitudinally adnate. Ovary-rudiment none. Ovary 3-celled, with 2 ovules in each cell; styles 2-cleft. Fruit a capsular berry, 3-coccous, hardly dehiscing. Seeds albuminous, with an arillus. Cotyledons broad, as long as the radicle.—Trees or shrubs, with distichous simple leaves. Flowers small, usually solitary or by pairs in the axils of the young leaves or spuriously racemose along the young leafless shoots.

Leaves membranous, without mucro . . . . . *M. patens.*
Leaves rigidly coriaceous, mucronate . . . . . *M. fruticosa.*

1. **M. patens,** Muell. Arg.; Bedd. Sylv. Madr., 196.—A leaf-shedding shrub, 3-6 ft. high, all parts glabrous, the young branchlets 4-angular; leaves variable, from oval to elliptical and almost orbicular, on a short slender petiole, membranous, obtuse at the base, $\frac{1}{2}$-1 in. long, blunt or rounded, glabrous, more or less glaucous beneath; flowers small, greenish, shortly pedicelled, solitary or by pairs in the axils of the young leaves; calyx of males turbinate, of the females explanate-bell-shaped and much larger,

the lobes accrescent in fruit; stamens in a column; ovary depressed-turbinate; styles 3, shortly reflexed-2-lobed; capsules rather fleshy, bright red, the size of a large pea, smooth, supported by the 6-lobed, radiating, ample, scarlet calyx.

Hab.—Frequent in the savannahs and savannah forests, especially along rivers, etc., from Pegu (chiefly the Sittang zone) down to Tenasserim.—Fl. March-May.—l.—SS.=All.

2. **M. fruticosa,** Muell. Arg.—A small shrub, 3-4 ft. high, shedding leaves in C.S., all parts glabrous, the branchlets 4-angular; leaves ovate-oblong to oval, on a short thin petiole, rounded or obtuse at the base, 1-1½ in. long, blunt or bluntish with a mucro, rigidly coriaceous, smooth, pale-coloured beneath, the lateral nerves almost immersed; flowers small, the males yellow and on slender, the females green and on shorter, pedicels, solitary or by pairs in the axils of the young leaves; calyx oboval-turbinate, the 6 rotundate short lobes inflexed; stamens in a column; ovary depressed-turbinate; stigmas 3, almost sessile, triangular, incurved; capsules depressed-globular, the size of a pea, smooth, red, 3-coccous, with 2 seeds in each cell, the arillus orange-coloured.

Hab.—Frequent in the drier hill forests, especially the pine forests, of Martabán, at 2,500 to 4,000 ft. elevation.—Fl. Fr. R.S.—l.—SS.=Metam.

SAUROPUS, Bl.

Monoecious. Male calyx imbricate, 6-cleft, -parted or -lobed, minute. Petals none. Disk none or outside the stamens, 6-lobed, the lobes opposite to the calyx-lobes. Stamens in a short column; anthers opening by 2 slits, the cells lengthwise adnate. Ovary-rudiment none. Ovary 3-celled, with 2 ovules in each cell; styles 3, very short, more or less distinct and 2-cleft or 2-parted. Capsule fleshy-coriaceous, or crustaceous, opening into 6 valves.—Shrubs, with distichous, alternating, simple leaves. Stipules subulate, longer persistent. Flowers axillary, the males sometimes conspicuous, and the calyx more or less fleshy, explanate and disk-like.

× Leaves 2-3 in. long, more or less ovate to ovate-lanceolate. Capsules the size of a cherry, pure white . . . . *S. albicans.*

×× Leaves ½-1 in. long, more or less orbicular to elliptical. Capsule the size of a large pea; flowers only ¼ lin. across; branchlets compressed-4-angular . . . . . *S. quadrangularis.*

As former, but branchlets compressed with rather convex sides . *S. compressus.*

1. **S. albicans,** Bl.—*Yo-ma-hin-yo.*—An erect simple-stemmed undershrub (or biennial ?), 2-4 ft. high, all parts quite glabrous, the stems almost terete, the branchlets more or less angular; stipules minute, subulate-acuminate, persistent; leaves from oblong-ovate and ovate-lanceolate to ovate, acute at the base, on a slender

1-1½ lin. long petiole, bluntish acuminate to bluntish with a mucro, 2-3 in. long, entire, flaccid, membranous, quite glabrous, glaucous-green or glaucescent beneath; flowers minute, reddish green, on slender 1½-2 lin. long pedicels, forming a very short raceme in the axils of the leaves, the females usually solitary ; male calyx discoid-6-lobed or -cleft ; capsules globular, the size of a small cherry, contracted or tapering into a short stalk, fleshy-coriaceous, glabrous, snow-white, supported by the 6-cleft calyx on a nodding ½-1 in. long peduncle slightly thickened upwards.

Hab.—Frequent all over Burma from Prome and Martaban down to Tenasserim, in the mixed forests.—Fr. C. S.—l.×s.—SS.=SiS. All.

2. **S. quadrangularis,** Muell. Arg.—A leaf-shedding low shrub 1½-3 ft. high, all parts glabrous (or in a variety the younger parts puberulous), the branchlets compressed-4-gonous or rhomboid-angular; stipules minute, subulate; leaves from obovate-elliptical and elliptical to almost orbicular, on a thin petiole about a line long, rounded or obtuse at the base, ½-1 in. long, rounded or almost retuse with a mucro, entire, membranous, glabrous ; flowers purplish green, minute, clustered and axillary ; male calyx orbicular-6-lobed; capsule the size of a pea, crustaceous, smooth.

Var. 2, **puberulus :** all younger parts and young leaves minutely pubescent.

Hab.—Frequent all over Burma from Ava and Martaban down to Upper Tenasserim, in the mixed (especially the upper ones) and open forests.—Fl. May.—l.—SS.=SiS. Lat. Arg.

3. **S. compressus,** Muell. Arg.—A leaf-shedding low shrub, very much like the preceding species, from which it differs by the simply compressed branchlets.

Hab.—In the Eng forests of Martaban.—Fl. May.—l.—SS.=Lat.

BREYNIA, Forst.

Flowers unisexual. Male calyx turbinate, high up gamosepalous, 6-lobed, the lobes infracted and imbricate in 2 rows, almost appendaged on the back. Petals and disk none. Stamens central, in a column, the anthers longitudinally adnate. Ovary 3-celled, with 2 ovules in each cell. Capsules berry-like, 3-coccous. Seeds albuminous, without an arillus or caruncle. Radicle shorter than the broad cotyledons.—Shrubs, with distichous simple leaves often glaucescent beneath. Capsules often red-coloured, the calyx under the fruit enlarged or not.

1. **B. rhamnoides,** Muell. Arg.; Bedd. Sylv. Madr., 196, t. 20, f. 2; Brand. For. Fl., 455.—*Gong-nyin-ya.*—A leaf-shedding small tree, often remaining shrubby, all parts glabrous; leaves

elliptical to elliptically ovate, on a slender petiole 1-1½ lin. long, acute or obtuse at the base, ½-1 in. long or rarely longer, blunt or bluntish, membranous, glabrous, more or less glaucescent beneath; flowers small, yellow, on short glabrous pedicels thickened upwards, the females solitary in the axils of the young leaves or more usually spuriously racemose along the short young shoots; male calyx truncate, with the lobes inflexed, the female one shortly lobed, with the lobes erect-appressed and not enlarged in fruit; stamens in a column; ovary truncate at the apex and depressed, longer than the calyx; capsules fleshy and berry-like, the size of a pea, 3-coccous, smooth, red, then purplish black.

HAB.—In savannah jungles and beach forests, chiefly in the neighbourhood of the sea, of Arracan and the Andamans.—Fl. Nov.-May.—l.—SS.=*SiS.* All. Aren. and Ca.

CICCA, L.

Flowers unisexual. Calyx 5-6, or rarely 4-parted. Disk of both sexes developed, gland-like, or in the females united and urceolate or annular. Stamens 3 or 5, variously connate, or free. Ovary 3-12-celled, with 2 ovules in each cell; styles 3 or 4, free to the base or shortly united, 2-cleft. Capsules drupaceous and slowly dehiscing, or berry-like and small, more or less sappy or fleshy, the cocci woody or crustaceous.—Trees, with distichous simple leaves. Flowers small, clustered in the axils of the leaves or spuriously interrupted-racemose along the leafless branchlets or shoots.

* *Capsules drupaceous, sappy-fleshy, large, the cocci bony or woody.*

× Flowers usually 6-merous; stamens in a column; ovary and capsule 3-celled; glands in females urceolate-connate; drupes white.

Leaves up to an inch long by ½ broad; drupes about an inch in diameter . . . . . *C. albizzioides.*

Leaves narrow, linear to linear-oblong; bark wrinkled and fissured; styles simply 2-cleft, the lobes broad and short, 3-crenate; capsules about an inch in diameter . . . . . *C. macrocarpa.*

As former, but bark smooth, peeling off conchoidally; styles twice 2-cleft, the end-lobes subulate; drupes only ½ an in. in diameter . . . . . *C. Emblica.*

× × Flowers 4-merous; stamens free, 4; glands in males and hermaphrodites free and distinct; ovary and drupes usually 4-celled.

Quite glabrous; flowers red; drupes yellow . . . . . *C. disticha.*

* * *Capsules berry-like, small, the cocci crustaceous.*

× Stamens 5, all free; disk annular-5-gonous; capsule 3-2-coccous, more or less succulent, white.

Armed with spinescent abortive branchlets; flowering branchlets terete . . . . . *C. Leucopyrus.*

Unarmed; flowering branchlets compressed 4-cornered . . . *C. obovata.*

×× Stamens 2-adelphous, the 3 inner ones wholly, the outer at the base only united; glands in females distinct; capsules 12-6-coccous, succulent, purple or purplish black.

Leaves ½-1 in. long; capsules depressed-globular; adult branches smooth . . . . . *C. reticulata.*

Leaves 1-2 in. long; capsules globular; adult branches lenticellate-rough . . . . . *C. microcarpa.*

1. **C. albizzioides,** Kz.—*Sha-ma* or *shit-sha.*—A tree (25—30 + 8—10 + 1—1½), leafless in H.S., the young branchlets puberulous; bark whitish grey, like that of *C. Emblica,* peeling off in rounded, conchoid, irregular flakes; leaves oblong, the lower ones elliptical or almost orbicular, almost sessile, rounded at the base, up to an inch long by ½ broad, retuse or obtuse, chartaceous, glabrous, glaucescent beneath; flowers minute, yellowish, glabrous, on slender glabrous pedicels, the females almost sessile, arising from the axils of the very young bract-like leaves and appearing as if racemose; calyx-lobes obovate-linear; staminal column slender and rather long; styles 3, connate at the base, 2-cleft, the end-lobes rather broad and entire; capsular drupes almost sessile, in a fresh state an inch or more in diameter, globose, only slightly depressed, hard-fleshy, watery-white and nerved, very acid and edible, the woody putamen 3-celled, slowly dehiscent.

Hab.—Not unfrequent in the upper mixed forests of the western slopes of the Yomah, up to 2,000 ft. elevation.—Fl. H.S.; Fr. C.S.—l.—SS.=SiS.

2. **C. macrocarpa,** Kz.—*Zi-hpyoo.*—A tree (20—25 + short + ½—1), sometimes remaining shrubby, shedding leaves in H.S., the branchlets shortly pubescent; bark thin, rough, longitudinally fissured, grey; leaves narrow-linear, almost sessile, rounded at the base, ½-¾ in. long, acute or bluntish, coriaceous, with the margins somewhat reflexed, glabrous, glaucous-green; flowers yellowish, on filiform pedicels, clustered, arising from the young, short, leafless shoots and forming rather dense up to an inch long racemes with a greyish pubescent rachis, arising singly or several together from above the scar of the branchlets fallen in the preceding years; calyx glabrous, 6-parted, the lobes obovate-oblong; staminal column slender; styles 3, shortly connate at the base, robust, 2-lobed, the lobes broad and short, 3-crenulate; capsular drupes twice as large as in *C. Emblica,* and in every respect the same as in the preceding species.

Hab.—Not unfrequent in the Eng and dry forests of the Prome district and the Irrawaddi zone of Pegu.—Fl. March; Fr. C.S.—l.—SS.=Lat. CaS.

3. **C. Emblica,** Kz. (*Phyllanthus Emblica,* L.; Bedd. Sylv. Madr., t. 258; Brand. For. Fl., 454, t. 52).—*Ta-sha-pen.*—A tree (30—40 + 10—15 + 3—4), shedding leaves in H.S., the young branchlets greyish pubescent; bark rather smooth, greenish grey, conchoidally

peeling off in irregular, rounded pieces; cut red; leaves linear-oblong to oblong, sometimes somewhat unequal, sessile or nearly so, rounded at the base, $\frac{1}{2}$-$\frac{3}{4}$ in. long, usually bluntish, thin-coriaceous, glaucous-green, glabrous or rarely slightly appressed-pubescent beneath; flowers small, yellowish, on slender pedicels, clustered in the axils of the young leaflets and forming spurious, more or less leafy, greyish pubescent racemes arising singly or several together from above the former year's fallen branchlets; calyx usually glabrous, 6-parted, the lobes obovate-oblong; staminal column slender but short; ovary glabrous; styles 3, elongated, twice 2-cleft, the end-lobes subulate; capsular drupes only about $\frac{1}{2}$ an in. in diameter, almost globose, in other respects like those of the preceding species.

HAB.—Frequent in all leaf-shedding forests, especially the dry and open ones, entering also the drier hill forests, from Ava and Martaban down to Tenasserim, up to 3,000 ft. elevation.—Fl. March-Apr.; Fr. C.S.—1.—SS.=∞.

REMARKS.—Wood brown, rather heavy, rather close-grained, the annual rings narrow, takes fine polish. W.=□′=35 pd. Bark and fruits used for tanning.

4. **C. disticha,** L. (*Phyllanthus distichus,* L.; Bedd. Sylv. Madr., 191).—*Thin-bo-zi-hpyoo.*—A leaf-shedding tree (25—30 + 8—10 + 2—3), all parts glabrous; leaves alternate, somewhat obliquely ovate to ovate-lanceolate, acute or obtuse at the oblique base, on a line long petiole, acuminate or acute, 1-2 in. long, chartaceous, glabrous, pale-coloured beneath; flowers minute, red, on short but slender pedicels, occasionally hermaphrodite, in small clusters forming slender, glabrous, interrupted racemes in the axils of the leaves or more usually arising along the stem and branches from reduced tubercle-shaped branchlets; calyx glabrous, 4-sepalled; stamens 4, free, 2 shorter; glands in females and hermaphrodites almost kidney-shaped; ovary usually 4-celled, glabrous; styles 3, free, 2-cleft; drupes globular, 6-8-lobed, pale yellow, sappy and acid, containing a 3-4-celled putamen.

HAB.—Only cultivated in villages and native gardens, especially in Chittagong and Pegu; also in the Settlements of the Andamans.—Fl. Apr.-May—1. SS.=*All.* ∞ (?).

5. **C. Leucopyrus** (*Securinega Leucopyrus,* Muell. Arg.; Bedd. Sylv. Madr., 197, t. 24, f. 4; Brand. For. Fl., 456, t. 54).—A large rigid-branched shrub or small tree, armed with short, spinescent, rigid, terete branchlets bearing leaves, all parts glabrous, the flowering branchlets terete or nearly so; leaves obovate to obovate-oblong, acute at the base, on a slender 1-2 lin. long petiole, usually retuse, from 3 to 12 lin. long, thick-membranous or almost coriaceous, glabrous, glaucescent in drying; flowers minute, on slender pedicels, yellowish, dioecious, clustered in the axils of the young leaves; calyx 5-parted, the males 5-androus, the stamens alternating with

as many glands; ovary rudimentary in the males, in the females globular, the 3 styles almost sessile, 2-cleft; glands 5, distinct; berry-like capsules white, rather dry, the size of a pepper-grain, 3-coccous, smooth.

HAB.—Burma, probably Ava.—Fl. R.S.

6. **C. obovata** (*Securinega obovata*, Muell. Arg.; Bedd. Sylv. Madr., 197; Brand. For. Fl., 455).—*Yae-chin-ya.*—A leaf-shedding large shrub, often growing out in a little tree (12—15 + short + ⅔—1), unarmed, all parts glabrous; the flowering branchlets soft and sharply 4-cornered; leaves variable, from elliptical to obovate and oboval, on a slender petiole 1 lin. long or somewhat longer, acute or obtuse at the base, 1-2 in. long, rounded or retuse or rarely acute to acuminate, membranous, pale-coloured or glaucescent beneath, the nerves thin; flowers minute, yellow, glabrous, dioecious, on slender pedicels, (the males on longer ones), densely clustered in the axils of the young leaves or along the leafless branchlets; calyx of both sexes 5-parted, the segments oblong, concave; stamens 5, free, alternating with 5 glands; ovary flask-like-narrowed into the short style-column; style-branches 3, 2-cleft; disk annular-5-gonous; capsules berry-like, with the fleshy pericarp thin and white, only 1-1½ lin. in diameter, 3-coccous.

HAB.—Common in the savannah jungles and along rivers all over Burma from Ava and Chittagong down to Tenasserim.—Fl. Fr. Apr.-May.—l.—SS.=All.

7. **C. reticulata** (*Phyllanthus reticulatus*, Poir; Bedd. Sylv. Madr., 190; Brand. For. Fl., 453).—A leaf-shedding large shrub, 12-15 ft. high, the young parts shortly pubescent, rarely quite glabrous; stipules triangular-linear, usually becoming spiny-hardened and recurved; leaves small, elliptical to elliptically and obovate-oblong, rounded at the base, on a thin often puberulous petiole hardly a line long, rounded or almost retuse at the apex, ½-1 in. long, chartaceous, glabrous, or more usually beneath minutely puberulous and somewhat glaucescent; flowers purplish outside, usually few together in the axils of the leaves or along the leafless shoots, on slender, filiform (the females on longer), puberulous pedicels; ovary globular, 6-12-celled, glabrous, the styles short, erect, 2-lobed; capsules depressed-globular, berry-like, with a bluish black, sappy (the sap purple) epicarp, glabrous, about 3 lin. in diameter, usually 10-6-coccous.

Var. 1, **reticulata proper**: young shoots and leaves beneath puberulous.

Var. 2, **glabra**, Thw.: all parts glabrous.

Hab.—Frequent in the shrubberies and low forests, but chiefly in the savannah jungles from Pegu and Arracan down to Tenasserim; var. 2: Arracan, in savannahs.—Fl. Fr. Nov.-Jan.—l.—SS.=Ar. SiS.

8. **C. microcarpa,** Bth.—A leaf-shedding large shrub, all parts glabrous, or rarely the young shoots puberulous, the older branches minutely lenticellate-warted; leaves oblong to elliptically and oval-oblong, on a slender 1-1½ lin. long petiole, obtuse or acute at the base, 1-2 in. long, acute or bluntish, chartaceous, glabrous, or rarely puberulous on the glaucescent under-surface; flowers minute, on slender pedicels, solitary or few together in the axils of the young leaves; calyx glabrous; stamens 5, the 3 inner ones connate, the 2 outer shorter and united only at the base; ovary globular, the styles very short; capsule berry-like and sappy, globular, the size of a pepper-grain, 10-6-coccous, smooth.

Var. 1, **microcarpa proper**: all parts glabrous.

Var. 2, **pubescens**: young shoots and often the under-surface of the leaves puberulous.

Hab.—Var. 1: in the tropical forests along choungs, from Chittagong and Pegu down to Tenasserim and the Andamans.—Fl. R.S.; Fr. Feb.-March.

BISCHOFFIA, Bl.

Flowers dioecious. Calyx deeply 5-parted, the lobes of the male concave-cucullate and imbricate. Petals and disk none. Males: stamens 5, free, inserted round an ovary-rudiment; anthers opening by 2 slits. Females: ovary surrounded occasionally by 5 staminodes, 3- or rarely 4-celled, with 2 ovules in each cell; styles connate at the base, simple, linear. Capsule drupaceous, sappy, almost indehiscent, containing a 3-4-coccous crustaceous putamen. Albumen scanty; cotyledons large, cordate-ovate, complanate, 3 times longer than the radicle.—Trees, with 3-foliolate long-petioled leaves. Flowers minute, in axillary panicles.

1. **B. Javanica,** Bl.; Bedd. Sylv. Madr., t. 259; Brand. For. Fl., 446.—A tree (30—40 + 12—18 + 2—4), shedding leaves in H.S., all parts quite glabrous; bark rather smooth, blackish grey; leaves 3-foliolate, on a 1½ to 6 in. long petiole; leaflets from broadly ovate to oblong-lanceolate, on petiolules varying in length from ½ to an inch, rounded or acute at the base, 3-5 in. long, shortly and rather abruptly acuminate, repand-toothed, succulent-membranous, glabrous; flowers greenish, in axillary glabrous panicles, the male minute, on slender but short pedicels, the females more than 2 lin. in diameter, on strong 2-3 lin. long pedicels; drupes globular, the size of a large pea, sappy, bluish black, smooth, containing a crustaceous 3- or rarely 4-coccous capsule.

Hab.—Frequent in the tropical forests and hill savannahs along choungs from Arracan, Pegu and Martaban down to Tenasserim, up to 2,500 ft. elevation.—Fl. March.—l.—SS.=A[illegible]. SiS. Metam.

Remarks.—Wood rather light, brown, coarse-fibrous, but close-grained, takes fine polish. W=□′=35; break.-weight=153—170 pd.

BACCAUREA, Lour.

Flowers dioecious or monoecious. Calyx 4-5 cleft, imbricate. Petals none. Disk none or present. Stamens 4-10, free, inserted round a lobed ovary-rudiment. Ovary 3- rarely 2-5 celled, with 2 ovules in each cell, stigmas almost sessile, 2-3-lobed or jagged. Fruit a spurious berry, covered with a coriaceous irregularly bursting epicarp, 5-1-celled, often few-seeded from abortion, the seeds enveloped in a large, white, sappy and edible arillus.—Trees, with simple often geniculate-petioled leaves. Flowers small, in racemes or spikes, sometimes collected in a panicle, or arising from the trunk or old branches.

Male calyx-lobes and bracts of both sexes a line long, female calyx nearly 3 lin. long . . . . . *B. sapida.*
All the above parts only half the size, the female calyx-lobes only a line long . . . . . *B. parviflora.*

1. **B. sapida,** Muell. Arg.; Bedd. Sylv. Madr., t. 280.—*Ka-naso.*—An evergreen tree (40—50+15—25+3—5), the leaf-buds and young branchlets appressed tawny-pubescent; bark about a line thick, roughish, corky-lamellate, grey; cut dry, pale-coloured; leaves from elliptically to obovate-lanceolate, acute at the base, on a glabrous 1-1½ in. long petiole geniculate thickened at the end, rather abruptly and bluntish acuminate, slightly repand-waved, chartaceous, 4-6 in. long, glabrous; flowers greyish or tawny-pubescent, yellowish, the males on very short puberulous pedicels supported by a lanceolate acuminate bract of about a line length and forming greyish pubescent racemes, the females large, sessile in the axils of the 2 lin. long lanceolate bracts and forming usually shorter but tawny-pubescent spikes arising solitary or by 2 or more from tubercle-like branchlets on the main and lateral branches; calyx 4-parted, the segments in the males incurved at the apex, densely greyish puberulous, only about a line long, those of the females oblong, nearly 3 lin. long, tawny-tomentose; ovary tawny-tomentose, the stigma sessile, discoid; berries globular, leather-yellow, softly but indistinctly puberulous, the size of a prune or large cherry, containing several soft walled cells, with 2 or more seeds enveloped in an agreeable acid sweet, edible, pale rose-coloured arillus.

Hab.—Frequent in the tropical forests, especially the open ones, and entering occasionally the moister upper mixed forests, up to 1,000 ft. elevation, from Chittagong and Ava down to Tennasserim and the Andamans.—Fl. March, Apr.; Fr. May-June.—s.—SS.=*SiS.*, Metam.

Remarks.—Wood very pale brown, rather heavy, of a short fibre, rather coarse-grained, rather hard, perishable, not used. W.=□′= 61 pd.

2. **B. parviflora,** Muell. Arg.—*Ka-na-so.*—An evergreen small tree; leaves resembling in size and shape those of *B. Motleyana*, elliptical or lanceolate-obovate, acute at the base, cuspidate-acuminate, glabrous when adult; flowers very minute, greenish tawny, at length almost purplish, minutely tomentose, racemose; racemes slender, few, arising solitary from the branchlets of the branches; bracts hardly ¼ lin. long, broadly ovate, acute; calyx densely and minutely papillose-tomentose, the lobes of the males ½, those of the females nearly a line long; ovary minutely tomentose, the stigmas sessile; fruits acid, edible.—(After Dr. Mueller.)

Hab.—Tenasserim.

ANTIDESMA, Burm.

Dioecious. Calyx-lobes 3-8, those of the male flowers imbricate in bud. Petals none. Stamens often as many as calyx-lobes, or fewer or more and opposite to them, round an ovary rudiment; filaments rather long; anthers opening by 2 slits. Disk various, situated between the ovary-rudiment and the stamens. Ovary 1-celled by suppression, with 2-ovules; style terminal or nearly so, 3- parted, the stigmatic lobes rigid and partly 2-lobed. Fruit a sappy drupe, indehiscent, containing a bony grooved putamen usually 1-seeded. Seeds without arillus. Albumen present. Cotyledons broadly ovate, complanate, the radicle elongate.—Trees or shrubs, with simple leaves. Stipules longer persistent. Flowers minute, in simple or branched spikes or racemes.

* *Flowers sessile or nearly so; stigmas terminal.*
× *Spike quite glabrous.*
All parts glabrous, the rachis of spike rather strong; leaves glossy . . . . . *A. Bunias.*
×× *Spike more or less pubescent.*
○ *Leaves rounded or retuse.*
More or less puberulous; spike rather robust, tomentose . . *A. Ghaesembilla.*
○○ *Leaves more or less acuminate.*
† *Calyx 3-lobed.*
Young shoots and leaves along the nerves pubescent . . . *A. Martabanicum.*
†† *Calyx 4-parted.*
Leaves small, 1-2½ in. long, hirsute above, densely pubescent beneath . . . . . *A. fruticulosum.*
Leaves 4-5 in. long, like all other softer parts shortly and softly pubescent . . . . . *A. velutinum.*
** *Flowers pedicelled.*
× *Stigmas lateral; all parts pubescent; bracts linear-lanceolate . . . . . A. velutinosum.*
×× *Stigmas terminal.*
Young parts slightly pubescent; racemes puberulous; stamens usually 4 . . . . . *A. Menasu.*
Young parts slightly pilose; racemes glabrous; stamens usually 2 *A. diandrum.*

1. **A. Bunias,** Spreng.; Bedd. Sylv. Madr., 200, t. 24, f. 3.—An evergreen small tree, the leaf-buds tawny-pubescent; stipules ovate-cordate, acuminate, deciduous; leaves lanceolate to elliptically lanceolate, on a strong glabrous petiole 2-3 lin. long, acute or obtuse at the base, 3-4 in. long, more or less acute or bluntish apiculate, coriaceous, glossy, glabrous; flowers small, greenish, sessile, forming a rather robust, simple or branched, slightly rusty-pilose spike in the axils of the leaves and at the end of the branchlets; bracts minute, ovate; calyx cup-shaped, obsoletely 3-toothed, slightly and minutely pilose; stamens usually 3; disk glabrous; styles 3, terminal; drupes elliptical, 2-3 lin. long, sappy, red, then bluish black, smooth, the putamen compressed, lacunose.

Hab.—Upper Tenasserim (according to Muell. Arg.).

2. **A. Ghaesembilla,** Gaertn.; Bedd. Sylv. Madr., 200; Brand. For. Fl., 446.—*Pyee-sin.*—A tree (20—25 + 4—8 + 1—2), leafless in H.S., the young parts tawny or greyish pubescent; bark ½ in. thick, even, finely longitudinally fissured, dark or blackish brown; cut dryish, red-brown; stipules linear, acute, pubescent, about 3-4 lin. long, very deciduous; leaves broadly oblong to obovate-oblong, on a rather slender puberulous petiole 3-6 lin. long, rounded at the base, 1½-3 in. long, retuse, blunt, or rarely somewhat acute, especially while young shortly pubescent beneath, more or less glabrescent; flowers minute, almost sessile, or on very minute pedicels, forming short, pubescent, compound spikes in the axils of the upper leaves and at the end of the branchlets; bracts minute, shorter than the flowers, while young obovate, at length linear, pubescent; calyx deeply 5-7-parted, pubescent, the lobes ovate; disk pilose; stigmas terminal; drupes almost obliquely obovoid, red, then blackish, sappy, smooth, the putamen compressed, pitted, more than a line long.

Hab.—Frequent in the tidal forests and entering the savannah jungles of Pegu and Martaban.—Fl. Apr.-May; Fr. June-July.—l.—SS.=All.

Remarks.—Wood rather heavy, fibrous, but close-grained, brittle, white or pale-coloured.

3. **A. Martabanicum,** Prsl.—A shrub (?), the branchlets whitish tomentose; stipules leafy, long persistent, minutely pubescent, elliptically oblong, acuminate, 2 or 3 times longer than the petiole; leaves elliptically oblong, on an 1-2 lin. long petiole, abruptly acuminate, 1-2 in. long, obtuse at the base, ciliate, on both sides along the nerves densely tomentose, glabrescent, coriaceous; flowers almost sessile, forming slender spikes; bracts ½ lin. long, linear, ciliate; calyx 3-lobed, pubescent, the lobes scarious along the margins, acute; stamens 3; disk glabrous; stigmas terminal.—(After Dr. Mueller.)

Hab.—Upper Tenasserim.

4. **A. fruticulosum,** Kz.—A small branched shrub, 2-4 ft. high, all softer parts pubescent; stipules linear, acuminate, tawny-pubescent, longer than the petiole, 2-3 lin. long; leaves small, elliptically to obovate-lanceolate, on a strong tawny-pubescent petiole up to a line long, rounded or obtuse at the narrowed base, 1-2½ in. long, shortly and bluntish acuminate with a mucro, rarely and only occasionally blunt or even retuse, membranous, above sparingly hirsute, beneath, especially along the nerves, appressed-pubescent; flowers minute, sessile, forming short and rather robust, tawny-tomentose spikes, simple or sometimes compound, usually arising from short reduced branchlets; bracts ovate-lanceolate, pilose, minute; calyx tomentose outside, 4-parted, the lobes rotundate, somewhat acute; disk almost glabrous; stamens 2 or 3, the anthers didymous; styles terminal, simple; drupes red, then bluish black, somewhat obliquely ovoid, smooth, about 2-2½ lin. long, the putamen compressed, slightly wrinkled.

Hab.—Tidal forests of Lower Pegu, on somewhat sandy soil near Pegu (station).—Fl. Fr. May-June.—l.

5. **A. velutinum,** Tul.—*Kin-pa-lin.*—An evergreen tree (25—30+8—15+2—3), all softer parts shortly and softly pubescent; stipules linear-lanceolate, acuminate, puberulous, about 3 lin. long, deciduous; leaves oblong-lanceolate, more or less obtuse at the base, on a strong puberulous petiole about 2 lin. long, shortly and rather abruptly acuminate, 4-5 in. long, chartaceous, shortly and softly pubescent on both sides, more or less glabrescent above; flowers minute, sessile, greenish white, forming rather slender, simple or panicled tawny-tomentose spikes in the axils of the leaves and at the end of the branchlets; bracts ovate, finally ovate-linear, much shorter than the expanded flowers, pubescent; calyx usually 4-parted, the lobes blunt; disk glabrous; stamens usually 4; ovary pubescent, the stigmas terminal.

Hab.—Common along choungs in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim.—Fl. May-June.—s.—SS.=SiS. Metam.

6. **A. velutinosum,** Bl.—An evergreen tree (15—20+8—10+1—2), all parts more or less yellowish pubescent; stipules ovate-lanceolate to linear-lanceolate, pubescent, about 3 lin. long; leaves elliptically to ovate-lanceolate, on a strong densely yellowish tomentose petiole 2-3 lin. long, obtuse or acute at the base, 4-6 in. long, acuminate, entire, chartaceous, pubescent beneath and on the principal nerves above; flowers minute, in densely bracted pubescent catkins, solitary or by 2-3, almost panicled in the axils of the leaves; bracts lanceolate, or the lower ones in the males often obovate and short; calyx 4-8-parted; stigmas lateral; drupes somewhat com-

pressed-globular, the size of a large pepper-kernel, on a densely pubescent straight pedicel about a line long, black, sappy, sparingly and shortly hispid.

Hab.—Tenasserim.—Fr. March.

7. **A. Menasu,** Muell. Arg.—*Kin-pa-lin.*—A tree (25—30 + 8—12 + 2—3), shedding leaves in H.S., the young shoots pubescent; bark brown, about ½ lin. thick, striate and almost smooth; cut brown; stipules linear, acuminate, pubescent, up to ½ in. long; leaves elliptically oblong, acute or obtuse at the base, on a strong pubescent petiole ¼-½ in. long, 4-6 in. long, shortly and rather abruptly acuminate, while young membranous and slightly pubescent, at length chartaceous and glossy above; flowers minute, whitish, on slender or robust minutely puberulous pedicels up to about ½ lin. long, forming lax minutely pubescent racemes arranged into panicles in the axils of the upper leaves and at the end of the branchlets; bracts minute, linear-lanceolate, much shorter than the pedicels, pubescent; calyx puberulous, 4-lobed to about its middle, the lobes broad, rotundate, somewhat acute; stamens usually 4; disk glabrous; stigmas terminal; drupes slightly compressed-ovoid, about 2 lin. long.

Hab.—Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and of Martaban; also on the Andamans.—Fl. Apr.—s.—SS.= ∞. *SiS.*

Remarks.—Wood brown, rather heavy, soft, of a fine and close grain.

8. **A. diandrum,** Roth.; Bedd. Sylv. Madr., 201; Brand. For. Fl., 447.—*Kin-pa-lin.*—A tree (12—20 + 6—8 + 1—2) shedding leaves in H.S., glabrous or the young shoots slightly pubescent; bark greyish brown, somewhat roughish; stipules linear-lanceolate, glabrous or pilose, about 2-3 lin. long; leaves variable in shape, from elliptically and obovate- to oblong-lanceolate, on a glabrous or slightly puberulous petiole 1-2 lin. long, shortly and often abruptly acuminate, 2-3½ in. long, succulent-membranous, glabrous, or while young often slightly appressed-pilose; flowers minute, on short pedicels, forming a quite glabrous or slightly puberous simple or compound raceme in the axils of the leaves and at the end of the branchlets; bracts broadly ovate, rounded, minute, glabrous; calyx cup-shaped, repand-4-toothed, glabrous; stamens usually 2; disk appressed-pubescent; styles 3, simple, subulate, terminal; drupes obovate-ellipsoid, red, then bluish black, sappy, about 2 lin. long, smooth, edible, the putamen grossly foveolate.

Hab.—Common in the mixed forests, especially the lower ones, all over Burma from Prome and Martaban down to Tenasserim; also Chittagong.—Fl. May-June; Fr. CS.—l:—SS.= ∞ *All. SiS.*

Remarks.—Wood rather heavy, red-brown or pale-brown, close-grained, takes fine polish. Adapted for cabinet-work.

APOROSA, Bl.

Flowers dioecious, in catkins. Calyx 3-6-parted, the segments in the males imbricate in bud. Petals and disk none. Stamens 2 or rarely 3-5, free, inserted round a minute ovary-rudiment; anthers opening in 2 slits. Ovary 2- rarely 3-celled, with 2 ovules in each cell; styles as many as cells, 2-cleft or 2-lobed. Capsule fleshy-coriaceous, slowly dehiscing, usually 1-seeded by abortion. Embryo straight, the cotyledons broad, the radicle thin. Albumen copious.—Trees or shrubs, with alternate simple leaves. Flowers minute, covered by the bracts and forming longer or shorter catkins.

* *Ovary villous, tomentose or pubescent.*
× *Leaves shortly and softly pubescent beneath.*
Berries densely velvety-tomentose . . . . . *A. villosa.*
× × *Adult leaves quite glabrous.*
Leaves very large, deeply cordate at base; fruits velvety-tomentose *A. macrophylla.*
Leaves not cordate at base.
Style-lobes 2-lobulate. Ovary densely tawny-villous . . . *A. villosula.*
Style-lobes simple, short. Ovary thinly appressed-pubescent, glabrescent . . . . . *A. Roxburghii.*
** *Ovary quite glabrous. Leaves, etc., all glabrous.*
Styles minute, tooth-like; leaves small . . . . . *A. lanceolata.*
Styles long, lacerate-fimbriate; leaves large, drying yellow . . *A. microstachya.*

1. **A. villosa,** Baill.—*Ye-mein.*—A tree (25—30 + 8—15 + 1—2), leafless in H.S., the branchlets and young shoots tawny-villous; bark thick, deeply longitudinally cracked and fissured; leaves varying from oblong and broadly oblong to elliptically obovate, on a tawny-villous petiole ½-¾ in. long, rounded or acute at the base, 4-6 in. long, bluntish to blunt-apiculate, chartaceous, above glabrous with the exception of the nerves, tawny-pubescent beneath; flowers small, the males protected by broadly ovate, acute, ciliolate, hirsute bracts, forming ½-¾ in. long dense catkins clustered in the axils of the leaves or above the scars of the fallen ones, the females forming similar but very short and almost oblong catkins, solitary or rarely by 2 or 3; ovary tawny-villous; capsules ovoid, apiculate, densely tawny-tomentose, orange-coloured, the size of a very large pea, usually 1-celled and 1-seeded by abortion.

Hab.—Frequent in the open forests, especially the Eng forests, from Pegu and Martaban down to Tenasserim.—Fl. March-Apr.; Fr. Apr.-May.—l.—SS.= Lat. Arg.

Remarks.—Bark used for dyeing red; exudes a red resin.

2. **A. macrophylla,** Muell. Arg.—*In-jin,* or *in-kyin.*—A tree (20—25 + 6—8 + 1—2), shedding leaves in H.S., all parts quite glabrous; bark thick, blackish grey, rough, deeply cracked and fissured; leaves very large, cordate-ovate to ovate-oblong, deeply cordate at the base, on a strong 2-3 in. long petiole thickened at the apex, bluntish or with a short point, 1-2 ft. long by ½-1 ft. broad,

thin-coriaceous, entire, glabrous, beneath slightly vesicular-dotted; flowers minute, the males protected by very broad (3 times broader than long), rounded, glabrous, ciliate bracts and forming dense catkins up to an inch long, the females protected by similar less broad densely tawny-tomentose bracts and forming very short cushion-like spikes, solitary or by 2-3 from above the scars of the fallen leaves and from tubercle-like reduced branchlets; ovary densely tawny-villous; capsules sessile, fleshy, yellow, almost globular, densely velvety-tomentose, the size of a large pea, 2-celled and 2-seeded.

Hab.—Frequent in the Eng forests all over Prome, Pegu, and Martaban down to Tenasserim.—Fl. Feb.-March; Fr. May-June.—l.—SS.=Lat.

3. **A. villosula,** Kz.—*Thit-sap.*—An evergreen tree (25—30 +8—12 +2—2½), the young shoots slightly appressed-pubescent and soon glabrescent; leaves oblong to elliptically and obovate-oblong, obtuse or acute at the base, on a glabrous ½-¾ in. long petiole thickened at the apex, shortly bluntish acuminate or apiculate, entire or nearly so, 3-5 in. long, rigidly chartaceous or thin-coriaceous, glabrous, in a dried state fuscescent and glossy; flowers minute, the males unknown, the females sessile, protected by broad, rather blunt, ciliolate, densely imbricate bracts, forming short catkins up to ½ in. long, arising by 2 or more from the axils of the leaves or from above the scars on the branches; ovary densely tawny-villous, the stigmas smooth, short, recurved and shortly 2-lobed at the apex; berries ovoid, the size of a large pea, orange-red, stigmatose-apiculate, sparingly and shortly hirsute or sometimes almost glabrous, 2- or 1-celled, with as many seeds.

Hab.—Frequent in the tropical forests along the eastern slopes of the Pegu Yomah, and from Martaban down to Tenasserim and the Andamans.—Fl. March, Apr.; Fr. May-June.—s.—l.—SS.=Lat. p.

4. **A. Roxburghii,** Baill.—An evergreen tree (25—30 +8—12 +2—3), the leaf-buds sparingly tawny-pubescent; leaves broadly- to oblong-lanceolate, acute at the base, on a ⅓-½ in. long petiole thickened at the apex, bluntish acuminate, remotely repand or almost entire, thick-membranous or chartaceous, 4-5 in. long, glabrous; flowers minute, the males protected by brown, ciliolate, broad and blunt bracts, forming dense yellow catkins up to an inch long usually arising by 2 or more from the axils of the leaves or from above the scars on the branches, the females in very short cushion-like catkins similarly situated; ovary thinly and sparingly greyish pubescent; styles 2, deeply 2-cleft, the branches entire; berries ovoid, yellowish, glabrous or slightly pubescent at the base, sessile, the size of a pea, 2- or 1-celled, with as many seeds.

Hab.—Not unfrequent in the tropical forests from Chittagong and Pegu down to Tenasserim.—Fl. Feb.-March.—s.—SS.=SiS. Metam.

5. **A. lanceolata,** Thw.; Bedd. Sylv. Madr., 199.—An evergreen tree, all parts glabrous; leaves lanceolate to linear-lanceolate, acute at the base, on a slender 2-3 lin. long petiole thickened at the apex, long but bluntish acuminate, chartaceous, glabrous, 2-2½ in. long, drying somewhat yellowish; flowers minute, the male catkins very slender, up to an inch long, glabrous, the females very short; bracts broad, ovate, glabrous; ovary spindle-shaped, glabrous, the styles very short and teeth-like; berries ovoid, the size of a small pea, smooth, 1-2-celled, with as many seeds.

HAB.—Tenasserim.

6. **A. microstachya,** Muell. Arg.—An evergreen tree (25—30 + 8—12 + 2—3), all parts glabrous; leaves oblong to elliptically oblong, acute or obtuse at the base, on a glabrous ½-1 in. long petiole thickened at the apex, usually bluntish acuminate, 3-5 in. long, thin-coriaceous, entire or repand, glabrous, in drying turning yellow like *Symplocos;* flowers minute, the male catkins about ½ in. long, the female ones very short, arising from the axils of the leaves or from above the scars on the branches; bracts roundish, fugaceously tawny-pilose-ciliate; anthers long-exserted; ovary flask-shaped, glabrous, the styles long, 2-cleft and thick-fringed; berries ovoid, the size of a pea, crowned by the rather large stigmas, smooth, yellowish, 1-2-celled, with as many seeds.

HAB.—Not unfrequent in the tropical forests from Chittagong and Ava down to Tenasserim, up to 4,000 ft. elevation.—Fl. March-Apr.; Fr. Apr.-May.—s.—SS.=Metam. Lat. p.

CYCLOSTEMON, Bl.

Flowers dioecious. Calyx deeply 4-5-parted, imbricate, the 2 outer sepals larger. Petals none. Disk deplanate-concave, nude in the centre or bearing an ovary-rudiment. Stamens 4-40, free, surrounding the disk; anthers oblong to ovoid, opening in 2 slits, the connective not produced. Ovary 4-2-celled, with 2 ovules in each cell, 4-2-sulcate; styles entire, united at the base, broadly 3-angular-ovate and almost sessile, or narrow and elongated. Drupes more or less fleshy, indehiscent, containing a 4-2-coccous almost crustaceous 4-1-seeded capsule.—Trees or rarely shrubs, with simple alternate leaves. Stipules deciduous. Flowers often small, in cushion-like clusters in the axils of the leaves or above the scars on the older branchlets. Fruits often orange-red.

* *Flowers on about ⅛ an in. long pedicels; stigmas sessile, large, obversely broad-triangular.*

Female flowers arising from the stem and branches; leaves large, laxly-veined . . . . . *C. macrophyllum.*

Female flowers in the axils of the leaves; leaves small, elegantly net-veined . . . . . *C. eglandulosum.*

* * *Flowers on pedicels hardly up to ½ lin. long; stigmas sessile, minute, 3-angular.*

Flowers greyish pubescent; drupes obsoletely 4-lobed, puberulous . . . . . *C. subsessilis.*

1. **C. macrophyllum,** Bl.; Bedd. Sylv. Madr., t. 278.—An evergreen tree (30—40 + 15—20 + 2—3), all parts glabrous; leaves unequal at the base, oblong to oblong-lanceolate, on a thick 2-3 lin. long petiole, more or less acuminate, 3-6 in. long, coriaceous, entire, glabrous, laxly veined; flowers rather large, tawny-velvety, on nearly an inch long pubescent pedicels, arising from tubercle-like reduced branchlets from the stem and older branches and branchlets; calyx-lobes almost orbicular, concave, tawny-velvety outside; drupes globose, the size of a cherry, on a ½-⅔ in. long peduncle, orange-coloured, 2-celled and 2-seeded, minutely tawny-velvety, crowned by the 2 sessile broadly 3-angular glabrous stigmas.

Hab.—Not unfrequent in the tropical forests of South Andaman.—Fr. Apr.-May.—s.—SS.=SiS. Metam.

2. **C. eglandulosum,** Kz.—An evergreen tree (40—50 + 15—20 + 3—4), all parts glabrous; leaves somewhat oblique, ovate-oblong to ovate-lanceolate, acute and obtuse at the base, on a slender petiole 2-3 lin. long, bluntish acuminate, 1½-2 in. long, entire, thin-coriaceous, elegantly net-veined, glabrous; male flowers glabrous, the females puberulous, about 3 lin. in diameter, on puberulous about ½ in. long pedicels arising singly or rarely by pairs from the axils of the leaves; ovary 2-celled, tawny-velvety-pubescent, the stigmas sessile, dilated 3-angular, crenate, glabrous.

Hab.—Rare in the tropical forests of Arracan.—s.—SS.=SiS.

3. **C. subsessile,** Kz.—An evergreen tree (25—30 + 15—18 + 1½—2), all parts glabrous; bark greenish white, 1-2 lin. thick, rather smooth; cut brown; leaves somewhat unequal at the base, oblong to elliptically-oblong, bluntish and often somewhat abruptly acuminate, 4-6 in. long, chartaceous, entire, waved or obsoletely crenate, glabrous, laxly net-veined; flowers small, on greyish pubescent pedicels hardly ½ lin. long, clustered in the axils of the leaves or above the scars of the fallen ones; calyx-lobes concave-orbicular, greyish pubescent outside, about a line long; drupes ovoid-oblong, obsoletely 4-lobed, about ⅔-¾ in. long, on a thick up to a line long peduncle, orange-coloured, minutely tawny-puberulous, 2-celled with as many seeds, crowned by 2 or rarely 3 bluntish, 3-angular, minute, sessile stigmas.

Hab.—Frequent in the tropical forests of Martaban and Arracan; also Chittagong.—Fl. R.S.; Fr. Apr.-May.—s.—SS.=SiS. Metam.

Remarks.—Wood brown, heavy, close-grained, apparently good.

HEMICYCLIA, Wght. & Arn.

Flowers dioecious. Calyx deeply 4- or 5-lobed, imbricate. Petals none. Disk concave, entire or crenate, encircling an ovary or nude. Stamens 8-25, free, inserted round the disk; anthers opening in 2 slits. Ovary 1-celled, with 2 ovules, the stigmas sessile or nearly so, almost discoid and turning reniform-2-lobed, deciduous. Drupes glabrous, more or less fleshy, the endocarp 1-celled and 1-seeded. Albumen copious. Cotyledons fleshy membranous, almost orbicular, the thin radicle 3 times longer.—Trees, with simple, alternate, usually rigid leaves. Stipules deciduous. Flowers small, clustered in the axils of the leaves.

Putamen of drupe irregular, obliquely truncate on both sides on the apex, slightly keeled . . . . . *H. Sumatrana.*
Putamen regular, half-terete . . . . . *H. Andamanica.*

1. **H. Sumatrana**, Muell. Arg.—An evergreen tree (30—50 + 15—20 + 3—4), all parts glabrous; bark 3-4 lin. thick, grey, lenticellate; cut greenish, dryish; leaves a little oblique and unequal at the base, lanceolate to oblong-lanceolate, acute at the base, on a 2-2½ lin. long petiole, long but bluntish acuminate, repand-serrate, 3-4 in. long, thin-coriaceous and rigid, glabrous, glossy, elegantly but inconspicuously net-veined; flowers small, yellowish green, on minutely puberulous strong pedicels about 2 lin. long, solitary or more usually by 2 or 3 in the axils of the leaves; calyx minutely puberulous outside, the 4 lobes more than a line long; ovary glabrous; drupes somewhat compressed-ovoid, the size of a pea, smooth, the putamen obliquely truncate at the top and slightly keeled on the back.

Hab.—Not unfrequent in the swamp forests and in marshy places along choungs in the tropical forests of the Irrawaddi alluvium and of Martaban.—Fl. March-Apr.—s.—SS.=All.

Remarks.—Wood heavy, pale greyish brown, coarsely fibrous, but close-grained, soft. A fine wood.

2. **H. Andamanica**, Kz.—An evergreen tree (40—50 + 20—25 + 4—7), all parts glabrous; leaves ovate-oblong to oblong-lanceolate, unequal at the rounded base, on a 2-3 lin. long petiole, slightly pubescent when young, caudate-acuminate, slightly repand-serrate, thin-coriaceous and rather rigid, 3-3½ in. long, elegantly net-veined, glabrous; flowers rather large, on minutely appressed-hairy pedicels 1-1½ lin. long, solitary or by 2 in the axils of the leaves; calyx minutely appressed-puberulous, the lobes concave-rotundate, the 2 inner ones of a thinner texture, about 2 lin. long; stamens numerous; drupes on a strong 2-3 lin. long peduncle

usually deflexed, obversely ovoid, more than half an inch long, terete, smooth, the putamen half-terete, thin-coriaceous.

Hab.—Frequent in marshy or low places in the tropical coast forests of the Andamans.—Fr. May.—s.

PUTRANJIVA, Wall.

Flowers dioecious, apetalous. Calyx in males 2-5, in the females 4-6-parted, slightly imbricate in bud. Disk none. Stamens 3-2, free, or 1-2-adelphous. Ovary-rudiment none. Ovary 3- or 2-celled, with 2 ovules in each cell; stigmas various. Fruit an indehiscent drupe, containing a bony 1-celled and 1-seeded putamen. Seeds albuminous. Cotyledons almost flat, ovate, palmatinerved.—Trees, with alternate, more or less serrate-toothed, simple leaves. Stipules paired. Flowers small, the males clustered or fascicled, the females solitary or few in the axils of the leaves.

1. **P. Roxburghii,** Wall.; Bedd. Sylv. Madr., t. 275; Brand. For. Fl., 451, t. 53.—*Touk-yap.*—An evergreen large tree, the young shoots slightly appressed-pubescent; leaves oblong to oblong-lanceolate, often somewhat oblique on the one side, on a rather slender about 2 lin. long petiole, acute at the base, 2-3 in. long, shortly mucronate-acuminate or occasionally blunt, sharply but inconspicuously serrate-toothed, thin-chartaceous, glabrous; flowers small, yellow, the males on short pedicels and forming dense axillary clusters, the females much larger, on nearly half an inch long, slightly pubescent pedicels arising singly or rarely by pairs from the axils of the leaves; stamens 1-3, the filaments united high up; ovary greyish tomentose; styles 3, dilated into as many crescent-shaped large stigmas; drupe ovoid to almost globular, the size of a small cherry, white from an indehiscent tomentum, containing an 1-seeded hard wrinkled putamen.

Hab.—Pegu (Dr. Brandis in 1858).—Fl. March-Apr.; Fr. Jan.

BRIEDELIA, Willd.

Flowers monoecious, rarely dioecious. Calyx deeply 5-parted, the lobes valvate, in the females often deciduous. Petals 5, alternating with the calyx-lobes and shorter than them. Disk developed, in the male simple and adnate to the calyx, in the female double, the outer similar to the male disk, the inner sheathing the ovary more or less high up, 5-lobed or -toothed at the apex. Torus column-like raised, bearing the stamens whorled round an ovary-rudiment. Anthers ovoid. Ovary 2- very rarely 3-celled, with 2-ovules in each cell; styles 2, two-parted. Drupe more or less sappy, containing a 2-coccous 1- or 2-seeded putamen. Seeds albu-

minous. Cotyledons broad, complanate, the radicle very short.—Trees or shrubs, sometimes scandent, with simple alternate leaves. Flowers minute, bracted, in spikes or clusters.

* *Erect trees. Ripe fruits more or less globular.*
○ *Young branchlets and shoots pubescent or tomentose.*
\+ *Flowers sessile.*

Leaves small, glaucous, sparingly and minutely pubescent beneath; flowers glabrous or nearly so . . . . . *B. tomentosa.*

\+ + *Flowers pedicelled.*

Leaves thin-chartaceous, one-coloured, pubescent beneath; flowers axillary, greyish tomentose . . . . . *B. pubescens.*

Leaves thin-coriaceous, glaucescent and minutely puberulous beneath, strongly net-veined; flowers glabrous, the clusters in axillary, simple or panicled racemes . . . . . *B. retusa.*

○ ○ *All parts glabrous.*

Leaves blunt or rounded; bracts of flower-clusters glabrous; flowers glabrous, the females crimson, shortly pedicelled . *B. amœna.*

Leaves abruptly and shortly acuminate or apiculate; bracts of flower-clusters greyish pubescent; flowers glabrous, the females almost sessile . . . . . *B. ovata.*

* * *Shrubs, scandent or very rarely erect. Ripe fruits more or less elliptical.*

Leaves bluntish; calyx glabrous or slightly pubescent, enlarging under the fruit; female flowers shortly pedicelled; disk smooth . . . . . *B. stipularis.*

Leaves shortly acuminate; calyx densely pubescent; flowers sessile; disk round the fruit pilose . . . . . *B. dasycalyx.*

1. **B. tomentosa,** Bl.—An evergreen tree (20—30 + small + ½—¾), often remaining shrubby, the young shoots usually puberulous; bark grey, about a line thick, longitudinally corky-lenticellate; cut brown; leaves lanceolate to linear lanceolate, obtuse at the base, on a slender 1-2 in. long petiole, more or less bluntish acuminate, thin-chartaceous, 1-2 in. long, above green and minutely and sparingly hairy and glabrescent, beneath glaucous and more or less sparingly pubescent; flowers monoecious, small, on very short pedicels or almost sessile, in small clusters in the axils of the leaves; calyx glabrous, the lobes 3-angular, acute, about ½ a line long; petals rotundate, toothed; disk orbicular, slightly lobed; drupes globular, the size of a pepper-kernel, sappy, smooth, bluish black.

Hab.—Frequent all over Burma from Arracan and Prome down to Tenasserim, in the open dry and upper mixed forests, rarely entering the drier savannah jungles, up to 2,000 ft. elevation.—Fl. R.S.; Fr. D.S.—s+l.—SS.=∞ *CaS. Dil.*

Remarks.—Wood pale greyish brown, heavy, close-grained, soft.

2. **B. pubescens,** Kz.—*Kyek-ta-yau.*—An evergreen tree (20—30 + 8—12 + 2—3), all softer parts pubescent; leaves elliptically obovate-oblong, rounded or obtuse at the base, on a pubescent petiole about 2 lin. long, shortly and abruptly acuminate or apiculate, thin-chartaceous, one-coloured, entire, above glabrous or almost

so, beneath softly tawny-pubescent; flowers small, white, on short pubescent pedicels, clustered in the axils of the leaves; calyx shortly and densely pubescent, the lobes lanceolate, about a line long; petals obovate, truncate and 3-toothed; disk large, orbicular, deep-yellow.

Hab.—Frequent along choungs in the tropical forests along the eastern slopes of the Pegu Yomah. Fl. Apr.—s.—SS.=SiS.

3. **B. retusa,** Spreng.; Bedd. Sylv. Madr., t. 260; Brand. For. Fl., 449, t. 55.—*Tseip-che.*—A tree (50—60 + 20—30 + 5—6), while young armed with woody spines about 2 in. long, shedding leaves in H.S., the young shoots shortly pubescent; leaves oblong to elliptically oblong, rounded or almost slightly cordate at the base, on a strong petiole 3-4 lin. long, acute, blunt or almost retuse, 3-5 in. long, entire, thin-coriaceous, glabrous above, minutely greyish pubescent and glaucescent beneath, the lateral nerves numerous, straight, prominent and parallel; flowers dioecious, on short pubescent pedicels, clustered, forming longer or shorter, shortly tomentose, interrupted spurious spikes in the axils of the leaves and often panicled at the end of the branchlets, or the clusters solitary in the axils of the new leaves; calyx glabrous, pubescent at the base, the lobes about a line long, lanceolate, acute; male disk stellately 5-lobed; drupes almost globular, the size of a pea, purplish black, glabrous, containing a dehiscent 2-coccous putamen.

Hab.—Not unfrequent from Ava to Pegu in the mixed forests, especially the upper and lower ones, entering also the savannah forests, up to 2,000 ft. elevation.—Fl. R.S.; Fr. C.S.—l.—SS. = *SiS.* All.

Remarks.—Wood grey, with a beautiful mottled grain, heavy, rather close-grained. □′=66 pd. Prized for house-posts, ploughs, &c.

4. **B. amœna,** Wall.—A leaf-shedding tree (15—25 + 2—3 + 1—2), all parts quite glabrous; leaves elliptical to oboval-elliptical, on a smooth petiole 2 lin. long, obtuse at the base, 2½-4 in. long, blunt or rounded, thin-chartaceous, glabrous, somewhat glaucescent beneath; male flowers greenish, the females crimson, glabrous, on short pedicels, forming dense clusters in the axils of the leaves; calyx glabrous, the lobes lanceolate, subulate-acuminate, nearly a line long; petals minute, obovate-oblong, rose-coloured; disk orbicular, slightly lobed; drupes globular, the size of a pea, sappy, purplish black, smooth.

Hab.—Ava.

Remarks.—Wood even- and close-grained, soft, the sapwood white, the heartwood dark grey, cloudy.

5. **B. ovata,** Dene.—An evergreen small tree, all parts glabrous; leaves oblong to elliptically oblong, acute or obtuse at the base, on a slender petiole about 2 lin. long, sharply apiculate or

rarely bluntish or shortly acuminate, 1½-3 in. long, chartaceous, glabrous, pale-coloured beneath; flowers small, the females almost sessile, the males on very short pedicels, glabrous, in dense clusters in the axils of the leaves; calyx glabrous, the lobes angular, about ½ a line long; disk in females cup-shaped; drupes globular, the size of a small pea, purplish black, smooth, containing a 2-coccous dehiscent putamen.

HAB.—Tenasserim and Andamans.—Fr. May.

6. **B. stipularis,** Bl.; Bedd. Sylv. Madr., 201; Brand. For. Fl., 449.—*Sin-ma-no-pyin.*—A large scandent shrub, all younger parts tawny or rusty pubescent; leaves elliptical to elliptically obovate, 2-4 in. long, rounded or almost slightly cordate at the base, bluntish or nearly so, obsoletely repand or entire, chartaceous, above minutely pubescent and glabrescent, beneath shortly pubescent, the nerves and veination thin but prominent; flowers small, greenish, sessile, the females on very thick (twice as thick as long) glabrous pedicels, few together, clustered in the axils of the small floral leaves, further up protected by conspicuous, ovate-lanceolate, acuminate, tawny-tomentose, stipule-like bracts; calyx glabrous or slightly appressed-pubescent outside, nearly 3 lin. in diameter, the lobes lanceolate, more than a line long, acuminate or subulate-acuminate; petals orbicular, shortly clawed; disk orbicular; styles 2, deeply and slenderly 2-cleft; drupes elliptically oblong, nearly ½ in. long, bluish black, sappy, smooth, supported by the spreading rigid calyx of about 4 lin. in diameter.

HAB.—Common in the mixed forests, especially the lower ones and the savannahs, all over Burma from Ava and Martaban down to Tenasserim.—Fl. close of R.S.; Fr. C.S.—l.—SS.=All. *SiS.* Metam. ∞ (?).

7. **B. dasycalyx,** Kz.—A large scandent shrub, the young shoots tawny-pubescent; leaves obovate to obovate-oblong, obtuse at the base, on a rather thick petiole about 2 lin. long, shortly acuminate, apiculate or bluntish, 2-6 in. long, obsoletely repand, chartaceous, glabrescent above, beneath somewhat glaucescent and shortly and sparingly pubescent, the nerves and veination very prominent; flowers small, shortly tawny-tomentose, sessile, numerous, in dense, globular, tomentose clusters in the axils of the leaves and forming often a sort of interrupted spurious spike (the leaves being reduced to floral leaves) at the end of the branchlets; calyx densely tawny-pubescent outside, about 2 lin. in diameter, the lobes in fruit a line long, lanceolate, acute; disk orbicular, smooth, with a ring of stiff bristles round the base of the drupe; petals obovate-linear; drupes ovoid-elliptical, the size of a pea, smooth, bluish-black, sappy, the calyx not accrescent.

Var. 1, **dasycalyx proper**: scandent shrub; leaves much larger and of thinner texture, acuminate.

Var. 2, **aridicola**, Kz.: reduced to a more or less erect small shrub; leaves smaller, up to 3 in. long, almost coriaceous, bluntish or blunt.

Hab.—Frequent in the dry and open forests of Ava, Prome, and Pegu; var. 1: in moister and more fertile places; var. 2: on laterite and gravel of the Eng forests of Prome.—Fr. C.S.—l.—SS.=*Dil.* CaS.

CLEISTANTHUS, H.f.

Flowers monoecious or dioecious. Calyx 5-parted, valvate. Petals 5, small, alternating with the calyx-lobes. Disk explanate or urceolate, almost entire to 5-parted, the torus in the males columnar-raised, bearing at the apex the rudimentary ovary surrounded by the 5 stamens. Ovary 3-celled, with 2 ovules in each cell; styles 3, more or less 2-cleft. Capsule dry, woody or crustaceous, sessile or stalked. Seeds without caruncle or arillus. Albumen more or less scanty. Cotyledons membranous, variously folded.—Trees, with alternate simple leaves. Stipules often paired. Flowers small, usually in clusters.

Capsules stalked; young parts and leaves beneath tawny-lepidote-pubescent . . . . . *C. myrianthus.*
Capsule sessile; all parts quite glabrous . . . . . *C. stenophyllus.*

1. **C. myrianthus**, Kz.—An evergreen tree (40—50+12—20+3—4), the young shoots almost scaly pubescent from appressed, tawny, short, silky hairs; leaves oblong to oblong-lanceolate, on a strong petiole 3-6 lin. long, obtuse at the base, more or less acuminate, from 2½ in. to nearly a foot long, thick-chartaceous, entire, glabrous above, beneath thinly coppery or tawny-lepidote-pubescent or sometimes scurfy-tomentose; flowers yellowish, small, on short glabrous pedicels, forming dense clusters in the axils of the leaves or above the scars of the fallen ones; bracts tawny-pubescent; calyx glabrous, the lobes nearly a line long, lanceolate, acute, in the males valvate and in the females slightly imbricate; capsules 3-coccous, on a nodding short stalk, the size of a small cherry, glabrous.

Hab.—Frequent in the tropical forests, especially along choungs, from Pegu and Martaban down to Tenasserim and the Andamans.—Fl. Jan.-Feb.; Fr. Apr.-May.—s.—SS.=SiS. Metam.

Remarks.—Wood rather heavy, pale brown, soft, rather coarsely fibrous.

2. **C. stenophyllus**, Kz.—A tree or shrub (?), all parts glabrous; leaves linear-lanceolate, acute at the base, on a 2 lin. long petiole, long and thinly acuminate, 3-4 in. long, chartaceous, entire, glabrous, somewhat pale-coloured beneath; flowers minute, sessile;

few together in small axillary clusters, the bracts ciliate; calyx slightly appressed-hairy outside; ovary glabrous, sessile.

Hab.—Tenasserim or Andamans.

CROTON, L.

Flowers usually monoecious. Calyx usually 5- rarely 4-6- (or in the females up to 12-) parted, slightly imbricate in bud. Petals as many as sepals, in the males usually developed, in the females often rudimentary or obsolete. Glands of disk alternating with the petals. Stamens 5 to very numerous, usually 10-20, the filaments inflected in bud. Ovary usually 3- rarely 2- or 4-celled, with a solitary ovule in each cell; styles dichotomously cleft. Capsules usually 3-coccous, the cocci 2-valved and 1-seeded. Seeds albuminous, with a spermaphore. Embryo erect, the cotyledons ovate, as long as the radicle.—Trees or shrubs, rarely undershrubs or herbs, with alternate simple leaves. Stipules paired, developed or obsolete. Flowers small, in racemes or spikes, rarely in clusters.

* *Styles simply 2-cleft to the middle or to near the base.*

× *Indument of young shoots silvery or coppery scaly.*

○ *Pedicels of female flowers very short and thick, sulcate.*

Leaves chartaceous, densely silvery or coppery scaly beneath, acuminate . . . . . *C. argyratus.*

Leaves coriaceous, bluntish to almost retuse, adult almost glabrous, lateral nerves faint . . . . . *C. robustus.*

○○ *Pedicels terete and often slender.*

Adult leaves glabrous or nearly so, coarsely repand-serrate; capsule about the size of a cherry-stone, lepidote; seeds about 3 lin. long . . . . . *C. oblongifolius.*

Adult leaves glabrous or nearly so; capsule the size of a pigeon's egg, scaly-stellate puberulous; seed ⅔ in. long . . . *C. Joufra.*

×× *Indument of young shoots consisting of sessile and tubercled-stalked stellate hairs.*

○ *Leaves penninerved, or indistinctly 3-nerved at base.*

Young leaves all over and adult ones beneath shortly pubescent; capsule the size of a pea, minutely puberulous; seeds about 2 lin. long . . . . . *C. Wallichii.*

○○ *Leaves 5- or 6-plinerved at base.*

+ *Capsule obsoletely 3-lobed or almost terete; leaves 5-plinerved at base.*

† *Inflorescence glabrous or nearly so.*

Adult parts glabrous or nearly so, female pedicels thick, silvery-scaly, male pedicels slender and glabrous; capsules almost oblong, almost glabrous . . . . . *C. Tiglium.*

†† *Inflorescence more or less stellately pubescent; leaves often with a stalked gland on the crenatures along the margin.*

△ Capsule the size of a pea or somewhat larger.

Young shoots rusty-scurfy; basal glands of leaves stalked; capsules sparingly appressed-stellate-hairy . . . . . *C. sublyratus.*

Young shoots softly floccose-stellate; basal glands of leaves sessile capsules densely and softly stellate-tomentose . . . . *C. flocculosus.*

△ △ Capsules the size of a bullet or pigeon's egg.

Young shoots minutely tubercled-stellate-hispid; basal glands of leaves stalked; capsules minutely tubercled-stellate-rough . *C. caudatus.*

++ Capsules deeply 3-lobed.

Leaves 3-nerved at the base, pubescent; capsule the size of a pea, densely tubercled-stellate-hispid . . . . . *C. calococcus.*

∗ ∗ *Styles twice dichotomously 2-cleft.*

All parts densely stellate-tomentose; floral bracts 2-3 lin. long, fringed with conspicuous gland-hairs; erect low undershrub . *C. crozophoroides.*

1. **C. argyratus,** Bl.—An evergreen tree (25—30+15—20+2—3), all younger parts silvery or coppery scaly; bark 2-3 lin. thick, grey, transversely scared and fissured lengthwise; cut pale-coloured; leaves ovate, elliptical to elliptically lanceolate, on a shorter or longer ($\frac{1}{3}$-$1\frac{1}{2}$ in. long) scaly petiole, 2-glandular and obtuse at the base, sharply acuminate, entire, thin-coriaceous or chartaceous, when full-grown glabrous above, silvery or coppery lepidote beneath; flowers small, white, on very thick, sulcate, scaly pedicels about $\frac{1}{2}$-1 lin. long, forming densely lepidote, more or less elongate racemes in the axils of the upper leaves and at the end of the branchlets, the rachis sulcate; calyx coriaceous, lepidote outside, glabrous within; petals and filaments villous; ovary scaly, brown; styles simply 2-cleft; capsules almost globular and slightly 3-lobed, the size of a large pea, 3-coccous, densely covered with brown or coppery scales; seeds smooth, about 2 lin. long or somewhat longer.

Hab.—Not unfrequent in the tropical forests from Martaban down to Tenasserim.—Fl. March.—s.—SS.=Metam.

Remarks.—Wood rather heavy, close-grained, of a fine silvery fibre, yellowish white, soft.

2. **C. robustus,** Kz.—An evergreen tree (15—25 + short + 2—3), the young shoots densely rusty-scaly; leaves elliptical to elliptically oblong, on a thick rusty-scaly petiole up to an inch long, obtuse or acute at the 2-glanded base, $1\frac{1}{2}$-5 in. long, blunt or bluntish with or without a mucro, rarely almost retuse, coriaceous, obsoletely repand or entire, beneath sprinkled with rusty or yellowish coloured scales and glabrescent, the lateral nerves faint; flowers small, the males greyish villous-scaly and shortly pedicelled, forming longer (the females larger, rusty-scaly and almost sessile and forming shorter) spike-like racemes, the rachis greyish or rusty-tomentose-scaly and sulcate; calyx tomentose-scaly; styles 2-cleft; ovary densely coppery-scaly; capsules globose-ovoid, 3-coccous and 6-sulcate, the size of a large pea, tawny-silvery, obscurely scaly-tubercled; seeds nearly 3 lin. long, oblong-3-angular, smooth, brown.

Hab.—Rather frequent in the low forests, from the southern base of the Pegu Yomah down to Tenasserim.—Fl. Nov.-Jan.; Fr. March.—l.—SS.=Arg. Lat. p.

3. **C. oblongifolius,** Roxb.; Brand. For. Fl., 440.—*Thit-yin.*—A tree (30—40 + 15—20 + 2—3), shedding leaves in H.S., the young shoots silvery or coppery lepidote; bark about ⅓ in. thick, greyish, shortly fissured; cut dryish, reddish; leaves oblong-lanceolate to elliptically oblong, on a 1-2 in. long petiole geniculate-thickened at the apex, more or less obtuse and 2-glanded at the base, bluntish or bluntish acuminate, thick-membranous or chartaceous, 5-10 in. long, coarsely and roundedly repand-toothed, while young sprinkled with silvery scales, turning quite glabrous; flowers greenish white, on rather slender lepidote pedicels about 2 lin. long, forming lepidote, more or less glabrescent, elongate racemes in the axils of the upper leaves and above the scars of the fallen ones; calyx silvery or greyish lepidote; petals villous inside; filaments sparingly pubescent; ovary lepidote; styles simply 2-cleft; capsules globose-3-coccous, the size of a cherry-stone or somewhat larger, woody, lepidote; seeds smooth, about 3 lin. long.

Hab.—Frequent in the mixed forests, especially the upper ones, from Ava and Martaban to Pegu and Arracan, up to 2,000 ft. elevation; often also cultivated by Burmans.—Fl. Jan.-Feb.; Fr. Apr.-May.—SS.=*SiS.* Metam.

Remarks.—Wood yellowish white, rather heavy, fibrous, but close-grained, soft, rather perishable.

4. **C. Joufra,** Roxb.—A tree (30—40 + 12—15 + 3—4), shedding leaves during H.S., the young shoots silvery, scaly and glabrescent; leaves oblong to oblong- and obovate-lanceolate, on a glabrous petiole 1-2 in. long, 2-glanded at the narrow rounded base, shorter or longer acuminate, 4-6 in. long, chartaceous, remotely and minutely repand-serrate, while young scaly beneath, more or less glabrescent; flowers small, whitish, on stellately puberulous about 2 lin. long pedicels, forming elongate, densely stellately-puberulous racemes in the axils of the upper leaves and often appearing crowded before the appearance of the leaves; bracts minute, linear; calyx densely stellately-tomentose, the sepals ovate; petals and filaments villous; ovary stellately tomentose, the styles simply 2-cleft; capsules ovoid, the size of a pigeon's egg, almost acute, tawny or greyish scaly-stellate-puberulous, woody, slightly 3-lobed, 3-coccous; seeds oblong, smooth, ⅔ in. long.

Hab.—Not unfrequent in the low and lower mixed forests of Pegu and Martaban.—Fl. Jan.—l.—SS.=*Arg.* All.

5. **C. Wallichii,** Muell. Arg.—A tree (30—40 + 18—25 + 3—4), shedding leaves in H.S., all younger parts shortly and densely stellate-pubescent; leaves obovate-oblong, rounded at the narrowed 2-glanded base, shortly and bluntish acuminate, on a puberulous petiole up to an inch long, 4-5 in. long, remotely repand-toothed, while young on both sides softly stellate-pubescent, more or less glabrescent above;

flowers small, greenish white, on 2-3-5 lin. long greyish pubescent pedicels, forming greyish-scaly-puberous elongate racemes in the axils of the young leaves or crowded before their appearance; petals and base of filaments villous; calyx densely greyish-stellate-tomentose; ovary shortly hispid-tomentose, the styles glabrous, simply 2-cleft; capsules 3-coccous, the size of a pea, crustaceous, minutely puberulous; seeds only about 2 lin. long.

HAB.—Rather rare in the tropical forests along the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim.—Fl. March-Apr.—s.—SS.= SiS. Metam.

6. **C. Tiglium,** L.—*Ka-na-kho.*—An evergreen treelet (15—20 + 4—7 + 1½—2½), the young shoots sprinkled with stellate hairs; bark smooth, ash-coloured; leaves oblong to ovate-lanceolate, on a slender glabrous petiole 1-2 in. long, obtuse or rounded at the 2-glanded base, 2-4 in. long, minutely and remotely repand-toothed, acuminate, membranous, yellowish green, adult glabrous; flowers small, the males on slender glabrous pedicels, solitary or by 2 or 3, the females larger, on short, thick, densely stellate-pubescent pedicels about 1-1½ lin. long, solitary, both sexes forming terminal glabrous or almost glabrous racemes at the end of the branchlets; male calyx glabrous or nearly so, the female sprinkled with stellate hairs; petals of males white, villous; filaments 15-20, woolly at the base; ovary tawny-stellate-tomentose; capsules oblong and obtusely 3-lobed, 3-coccous, ⅔ to nearly an inch long, almost glabrous; seeds smooth, about ½ an in. long or longer, purgative.

HAB.—Frequently cultivated as a hedge plant in villages, all over Burma from Ava and Chittagong down to Tenasserim.—Fl. Sept.; Fr. C.S.—s.—SS.= *All.*

REMARKS.—Wood white, hard.

7. **C. sublyratus,** Kz.—A leaf-shedding shrub, 5-8 ft. high, the young shoots rusty-scurfy; leaves obovate to almost lyrate-oblong, rounded or almost cordate at the narrowed stipitately 2-glanded base, blunt to bluntish acuminate, on a stellately-scurfy petiole ¼-½ in. long, 3 to 5 in. long, sharply but minutely repand-serrate, membranous, when full-grown glabrous or sparingly stellate-rough along the nerves beneath; flowers small, pedicelled, stellately tomentose, forming a rusty or tawny-coloured densely and shortly stellate-tomentose raceme terminating the young shoots which arise from above the scars of the fallen leaves; sepals broadly lanceolate, acute, tawny-pubescent outside; petals along the margins ciliate-pubescent; torus pilose; stamens about 15-20, glabrous; petals in females none; ovary densely tawny-stellate-tomentose, the stigmas short; capsules almost globular, 3-coccous, the size of a small pea, crustaceous, smooth, sparingly sprinkled with appressed-

stellate hairs; seeds nearly 2 lin. long, smooth, longitudinally whitish and brownish variegated.

HAB.—Not uncommon in the forests along the sea-coast of the Andamans.—Fl. Fr. Apr.-May.—l. (?).

8. **C. flocculosus,** Kz.—An evergreen (?) tree (20—25 + 8—10 + 2—3), the young parts covered with a dense, soft, fugaceous, white or yellowish stellate tomentum; leaves more or less cordate-ovate, 2-glanded at the cordate or rounded base, bluntish and rather abruptly acuminate or apiculate, 1½-3 in. long and often nearly as broad, crenate or crenate-serrate, with or without a gland in the crenatures, membranous, palmately 5-nerved at the base, while young densely stellate-floccose, glabrescent above or on both sides; capsules in terminal racemes, pedicelled, nodding, almost globular, and obsoletely 3-angular, the size of a large pea, crustaceous, densely and softly greyish-stellate-tomentose; seeds about 2 lin. long, elliptically oblong, smooth, with rounded back.

HAB.—Rather rare in the swamp forests of the Irrawaddi alluvium from Prome to the Irrawaddi zone of Pegu.—Fr. Oct.—s.—SS.=All.

9. **C. caudatus,** Geisel.—A large scandent shrub, the younger parts scurfy-strigose from stellate bristly hairs; leaves from oval and ovate to oblong-ovate, cordate rounded or almost truncate at the stipitately 2-glanded base, on a stellately rough petiole ½-1 in. long, shortly and rather abruptly acuminate, rigidly membranous, 2-3 in. long, more or less crenate-serrate, and often furnished with stalked glands in the crenatures, rough on both sides, while young densely stellate-hispid beneath, finally only sprinkled with tubercled-stellate, minute, stiff hairs, the transverse net-veination prominent; flowers small, dull-yellowish green, the females shortly and thick-pedicelled, the males on rather slender stellate-pubescent pedicels up to 2 lin. long, solitary or by 2 or 3 to each bract, and forming rather long stellate-pubescent racemes at the end of the branchlets; calyx greyish stellate-pubescent outside, glabrous or nearly so within; petals of the males rather shorter than the sepals, woolly along the margins; filaments long white-pilose at the base; female calyx a little enlarging, the sepals almost 3-ribbed; ovary densely tawny-stellate-hispid, the styles deeply 2-cleft; capsules large, woody, the size of a bullet or pigeon's egg, obscurely 3-cornered, 3-coccous, covered with a pale tawny, minutely stellate, somewhat scurfy, rough tomentum; seeds more than ⅓ in. long, transversely and obscurely furrowed on the flattened back, smooth and glossy.

Var. 1, **caudatus proper:** capsules the size of a bullet or somewhat larger; seeds quite glabrous.

Var. 2, **minor**: capsules the size of a large pea or small cherry; seeds while unripe sprinkled with stellate hairs.

Hab.—Var. 2: frequent in the mixed forests, especially the lower ones, all over Prome and Pegu.—Fl. Fr. May-June.—l.—SS.=∞ (?),

10. **C. calococcus,** Kz.—A shrub, all parts thinly covered with short, stiff, stellate hairs; leaves elliptically ovate to ovate, rounded at the 2-glanded base, on a slender stellately rough petiole 3-4 lin. long, shortly acuminate, minutely repand-serrate, rarely almost entire, 1-2 in. long, membranous, yellowish green, stellate-pubescent beneath, above stellately rough; flowers slenderly pedicelled, in slender pubescent racemes terminating the branchlets; bracts minute, subulate, hirsute; calyx hispid, the lobes under the fruit about 1½ lin. long, lanceolate; capsules deeply and almost divaricately 3-lobed and 3-coccous, the size of a pea, covered with tubercles terminated by radiating stiff hairs; seeds brown, smooth.

Hab.—In shrubberies around Rangoon.—Fr. June.—SS.=Lat.

SUMBAVIA, Baill.

Flowers monoecious. Calyx in the males 5-parted and valvate, in the females 6-parted and slightly imbricate. Petals in the males conspicuous, in the females minute, gland-like or obsolete. Stamens numerous, on a central, minutely stellate-tomentose, convex receptacle surrounded at the base by a rudimentary disk; anthers erect, basifix, 2-rimose, the cells adnate. Ovary-rudiment none. Ovary 3-celled, with a solitary ovule in each cell; styles 3, united at the base and circinnately revolute. Capsule 3-coccous. Seeds arillate.—Trees, with alternate, simple, triplinerved leaves 2-glanded at the base. Flowers small, bracted, spicate-racemose.

1. **S. macrophylla,** Muell. Arg.—An evergreen tree (25—35 + 8—15 + 2—3), the young shoots shortly but densely scurfy-tomentose; leaves ovate-lanceolate to ovate-oblong, shortly and roundedly or angularly produced or narrowly peltate at the narrowed 2-glanded base, on a silvery scurfy-puberulous petiole 1-2 in. long and thickened at the apex, acuminate, ½-¾ ft. long, thin-coriaceous, almost entire, glabrous above, minutely and densely almost scurfy-whitish-tomentose beneath, the transverse veins rather strong; flowers rather small, on short tomentose pedicels, forming a tawny scurfy-tomentose raceme in the axils of the leaves; calyx tawny-tomentose, about 2 lin. in diameter or somewhat larger; hypogynous disk urceolate, the receptacle tomentose; ovary tawny-stellate-tomentose; styles erect, spreading.

Hab.—Frequent along choungs in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim.—Fr. C.S.—s.—SS.=SiS. Metam.

AGROSTISTACHYS, Dalz.

Flowers dioecious. Calyx of males regularly and valvately 3-4-parted, of the females imbricate in bud. Petals in males twice as many as sepals, in the females isomerous. Stamens 8-12, in two whorls, the upper whorl 4-6-androus, the lower one with as many anthers as there are petals; anther-cells free almost to the apex and suspended from the connective, unequally 2-valved. Ovary-rudiment none. Ovary 3-celled, with a solitary ovule in each cell; styles 3, connate at the base and 2-cleft. Capsule 3-cocccus, dry.—Shrubs or trees, with alternate penninerved leaves and paired stipules. Flowers in 6- 3- or 2-stichously bracted axillary spikes. Bracts 3-1-flowered, scarious.

1. **A. longifolia,** (*A. Indica,* var. *longifolia,* Muell. Arg.).—An evergreen shrub (?), all parts glabrous; leaves elongate cuneate-oblong, gradually narrowed into the short petiole or narrowly decurrent almost to its base, ½-1 ft. long, acuminate, rigidly chartaceous, slightly repand-toothed towards the apex, glabrous; young flower-spikes arising by 3-1 from the axils of the leaves, the scarious distichous bracts appressed-pubescent.

Hab.—Tenasserim or the Andamans.

ALEURITES, Forst.

Calyx almost irregularly valvately bursting (2-3-parted). Petals in both sexes 5, twisted or imbricate in the bud. Disk present in both sexes, in the males urceolate or reduced to 5 glands. Stamens numerous, on a conical naked torus; anther 2-rimose, the connective not produced. Ovary-rudiment in males absent. Ovary 2-5-celled, with a solitary ovule in each cell; styles as many as ovary-cells, deeply 2-cleft. Fruits large, drupaceous-capsular, 2-5-coccous, the cocci bony and hard. Seeds compressed-globular, without spermaphore, spuriously white-arilled. Albumen oily. Cotyledons large, orbicular-ovate, the radicle minute.—Trees, with long-peduncled 3-5-plinerved, simple or lobed leaves 2-glanded at the base. Flowers monoecious, forming large terminal panicles, the males usually more slenderly pedicelled.

1. **A. Moluccana,** Willd.; Bedd. Sylv. Madr., t. 276.—An evergreen tree (40—60 + 20—30 + 5—6), the young shoots covered with a brownish stellate or almost scaly minute tomentum; bark smooth, olive-coloured; leaves ovate-lanceolate to ovate, somewhat truncate and obtuse at the 2-glanded base, on a brownish stellate-puberulous petiole 2-2½ in. long, acute or acuminate, simple or produced into 1 to 3 bluntish or acute lobes, 3-5 in. long, thin-

coriaceous, while young covered with a brownish or whitish minute stellate tomentum, soon glabrous and opaque; flowers rather small, white, on short pedicels, forming densely brownish stellate-tomentose large panicles at the end of the branchlets; calyx tawny-velvety; petals white, oblong, nearly 3 lin. long; ovary shortly tomentose; styles two, 2-cleft to the base; drupes large, up to 2½ in. in diameter, fleshy, rather globose, pretty smooth, olive-coloured, containing 2 or sometimes a single, hard, 1-seeded, irregularly furrowed nut; seeds very oily.

Hab.—Occasionally cultivated in villages of Pegu and Tenasserim.—Fl. H.S.; Fr. Aug.

Remarks.—Exudes gum, especially from the fruits. Seeds produce about 50 per cent. of a lamp-oil called Kekuna in Hindustan, and plenty oil-cake.

SYMPHYLLIA, Baill.

Flowers monoecious. Calyx 3- to 5-parted, the male valvate, the female imbricate in bud. Petals and disk wanting in both sexes. Stamens free, alternating with the sepals, inserted round a columnar ovary-rudiment; anthers erect, 2-rimose. Ovary 3- or rarely 2-celled, with a solitary ovule in each cell; styles as many as ovary-cells, united in a short column, divaricately spreading, densely papillose-fimbriate.—Shrubs, with simple penninerved leaves crowded at the end of the branchlets. Stipules minute. Flowers sessile or nearly so, spiked, forming terminal poor panicles.

1. **S. Silhetana,** Baill.—An evergreen shrub, the young shoots more or less stellate-puberulous; leaves from spatulate- to oblong-lanceolate, on a strong, shortly tomentose, glabrescent petiole 1-2 lin. long, rounded or cordate at the narrowed base, from 3 to 8 in. long, acuminate, chartaceous, entire, while young sprinkled with minute stellate hairs, soon glabrous; flowers small, greenish white, sessile, clustered, in short greyish-tomentose spikes forming a terminal rather short panicle; male calyx glabrous or sprinkled with stellate hairs, the female one much larger, whitish stellate-pubescent, the lobes broad-oval, acute.

Var. 1, **Silhetana proper:** flowers soon glabrescent.

Var. 2, **trichantha,** Muell. Arg: flowers densely greyish stellate-pubescent.

Hab.—Var. 2: in Tenasserim.

TREWIA, L.

Flowers dioecious. Calyx 3-4-parted, in the males valvate, in the females imbricate in bud. Petals and disk in both sexes wanting. Stamens very numerous, free, on a central depressed-hemispherical

receptacle; anthers 2-rimose, the connective not peculiarly produced. Ovary-rudiment none. Ovary 3-4-celled (the cells usually confluent into 2 only) with a solitary ovule in each cell; styles as many as ovary-cells, connate at the base, very long and simple, papillose on the inner face. Fruit a drupe, corky-fleshy and indehiscent, the putamen almost bony. Seeds without arillus or spermaphore. Albumen copious.—Trees, with opposite simple leaves. Flowers small, in axillary racemes.

1. **T. nudiflora,** L.; Bedd. Sylv. Madr., 281; Brand. For. Fl., 443.—*Ye-hmyot.*—A tree (60—70 + 30—40 + 9—10), shedding leaves during H.S., the young shoots more or less pubescent; bark greyish, corky-lenticellate, otherwise even, about 2-3 lin. thick; cut greenish brown; leaves ovate to ovate-oblong, obtuse, rounded to almost cordate at the 3- or almost 5-nerved base, on a pubescent glabrescent petiole 1-2 in. long, acuminate, 4-6 in. long, membranous, entire, especially beneath pubescent, more or less glabrescent above; flowers small, pedicelled, the males clustered and forming long racemes arising from above the scars of the fallen leaves, the females on very short, thick, villous pedicels, in shorter puberulous racemes or often reduced to 4 or 1 flower at the summit of the nude peduncle; ovary and style pubescent or tomentose, the stigmas very long; drupes depressed-globular, the size of a small wood-apple, almost glabrous, corky-fleshy, containing a bony putamen 4- to 2-celled with as many seeds.

Hab.—Frequent along choungs in the tropical forests and moister upper mixed forests all over Burma, from Chittagong and Pegu down to Martaban; rarely entering the savannah forests.—Fl. H.S; Fr. begin. of R.S.—s × l.—SS.= ∞ SiS.

Remarks.—Wood white, turning yellowish, rather heavy, coarse-fibrous, but close-grained, soft.

MALLOTUS, Lour.

Flowers dioecious, rarely monoecious. Calyx 3-5- (rarely 2-) parted, in the males valvate in bud, in the females high up tubular or flask-like cohering and finally rupturing longitudinally, or free. Petals and disk none, or rarely the latter developed in the males. Stamens numerous, free or cohering at the base, on a central somewhat dilated receptacle; anthers 2-rimose. Ovary-rudiment none or indehiscent. Ovary 3- rarely 5-2-celled, with a solitary ovule in each cell; styles as many as ovary-cells, simple, almost free or connate at the base, papillose. Capsule dry, 3- or sometimes 5-2-coccous. Seeds without spermaphore. Albumen copious. Cotyledons broad, longer than the radicle.—Trees or shrubs, with alternate or opposite simple or rarely lobed leaves often peltate at the base. Flowers small, in racemes or spikes, terminal or spuriously axillary.

* *Capsules unarmed, but covered with a various tomentum from tomentose to glandular.*
○ Capsules 2-coccous, velvety-tomentose.
Scandent shrub ; softer parts stellately pubescent . . . *M. repandus.*
○○ Capsules 3-coccous.
Leaves beneath glaucescent and crimson-resinous ; capsules densely covered with crimson resinous powder . . . *M. Philippinensis.*
Ovary silky-pubescent . . . . . *M. decipiens.*
* * *Capsules armed with longer or shorter, lax or crowded prickles, the indument various.*
○ Racemes or spikes collected in terminal, ample, rarely contracted panicles.
\+ Leaves peltate, more or less orbicular-ovate.
Leaves broadly peltate, usually 3-lobed ; capsules short-peduncled, globular, covered with a thick dense stratum of scurfy-pubescent, soft, short bristles . . . . . *M. barbatus.*
Leaves usually narrow peltate, not lobed ; capsules sessile, densely covered with loose soft-pubescent bristles nearly as long as the diameter of the capsule itself . . . . *M. ricinoides.*
\+\+ Leaves not or indistinctly peltate, shortly white or rarely tawny-tomentose beneath, often rhomboid-ovate. Capsule shortly and laxly muricate.
Capsules sessile or nearly so, 4- or 5-coccous, almost globular, scurfy whitish tomentose . . . . . *M. tetracoccus.*
Capsules 3-coccous and 3-lobed, tawny-tomentose . . . *M. paniculatus.*
○○ Racemes or spikes terminal or axillary, simple or at least not panicled. Capsule lobed, 3-coccous, shortly and laxly muricate.
\+ Capsules with hairy indument.
Leaves broadly peltate, densely pubescent, orbicular-ovate ; capsules peduncled, tomentose and glandular . . . . *M. Roxburghianus.*
\+\+ Capsules densely yellowish glandular, otherwise glabrous. Leaves more or less narrowed towards the base.
† Leaves peltate.
Young parts and leaves beneath puberulous . . . . *M. acuminatus.*
† † Leaves not peltate.
Young parts and leaves beneath puberulous ; petioles long and slender . . . . . *M. Helferi.*
All parts quite glabrous ; petioles proportionally short . . *M. muricatus.*

1. **M. repandus,** Muell. Arg. ; Bedd. Sylv. Madr., 210.—*Nalyin-bo.*—A large scandent shrub, the young parts densely tawny or yellowish puberulous ; leaves ovate to rhomboid-ovate, almost truncate at the narrowly peltate usually 3-nerved base, on a tawny-puberulous petiole 1-2 in. long, shortly bluntish acuminate, membranous, 2-3 in. long, entire or obscurely sinuate-toothed or occasionally produced into 1 or 2 short lateral lobes, somewhat scabrous above, beneath shortly and softly tawny or yellowish puberulous, the nerves and transverse veination thin ; flowers tawny-velvety-tomentose, rather long-pedicelled, the males clustered, the females solitary, forming numerous tawny-tomentose racemes often crowded and panicled at the end of the branchlets ; calyx-lobes ovate, velvety-tomentose outside ; ovary tomentose, 2-celled ; styles sessile ;

capsules 2-coccous and didymous, shortly tawny-velvety, the cocci as large as a small pea; seeds grey, almost globular, indistinctly roughish, opaque.

HAB.—Frequent all over Burma from Ava and Chittagong down to Martaban and Pegu, especially in the drier mixed forests and in the open and dry forests.—Fl. Jan.-Feb.; Fr. March-Apr.—l.—SS.=∞.

2. **M. Philippinensis,** Muell. Arg.; Bedd. Sylv. Madr., t. 289; Brand. For. Fl., 444.—*Tou-thi-tin.*—An evergreen tree (25—30+8—15+3—4), the young shoots densely tawny or rusty puberulous; leaves from ovate-oblong to obovate-lanceolate and broadly lanceolate, acute or obtuse at the narrowed strongly 3-nerved base, on a puberulous more or less glabrescent petiole 1-2 in. long, shortly acuminate, chartaceous, 3-5 in. long, slightly sinuate-toothed or almost entire, glabrous above, beneath more or less minutely puberulous, crimson-gland-dotted or glabrescent and somewhat glaucescent; flowers densely tawny-puberulous, small, sessile or nearly so, the males clustered, the females solitary, both forming simple, tawny-puberulous, rather stiff spikes at the end of axillary shoots and often crowded into a sort of panicle at the end of the branches; ovary densely crimson-glandular, the stigmas sessile; capsules 3-coccous, the size of a large pea, covered with a dense crimson indurated-glandular powder; seeds black, smooth.

HAB.—Frequent, especially in the dry and low forests, but also in the drier mixed forests, all over Burma, from Ava and Chittagong down to Tenasserim and the Andamans, ascending also into the hill Eng forests up to 2,000 ft. elevation.—Fl. R.S.; Fr. Feb.-March.—l.—SS.=*Dil.* SiS. Metam.

REMARKS.—Bark used for tanning; root a red dye; the crimson powder of the capsules (kapli or kamila-powder) form a scarlet dye chiefly for silk.

3. **M. decipiens,** Muell. Arg.—A shrub; leaves opposite, shortly petioled, shortly 3-nerved, lanceolate-obovate, maculate-2-4-glanded above the base, bluntish-toothed upwards, beneath sprinkled with minute yellowish glands, and while young first tawny-villous, then densely and softly pubescent; male flowers shortly pedicelled and almost clustered; stamens about 20, free, surrounding a minute ovary-rudiment, or the latter often wanting; female calyx membranous, the lobes narrowly 3-angular-ovate, acuminate; ovary silk-hairy, the stigmas strongly penicellate-papillose. Nearly allied to *M. muricatus.*—(After Muell. Arg.)

HAB.—Tenasserim.

4. **M. barbatus,** Muell. Arg.; Bedd. Sylv. Madr., 208.—A low shrub 3 to 4 ft. high, all softer parts covered with a loose floccose or almost scurfy-tawny or greyish stellate tomentum; leaves large, on a floccose-scurfy-tomentose petiole 1½-4 in. long, orbicular-ovate to ovate, with a rounded, broadly peltate, up to 10-nerved base,

about a foot or more long and broad, acute or shortly acuminate, produced into 2 lateral, acute or acuminate lobes, remotely repand-toothed, thick-membranous, glabrescent or quite glabrous above, beneath stellately floccose-tomentose and strongly transversely veined and net-veined; flowers rather small, on short tawny-tomentose pedicels, forming a densely tomentose long terminal raceme simple or panicled at the base; bracts thick, subulate, tomentose; female calyx 4-cleft, tawny-tomentose; ovary densely villous; capsules globular, the size of a small cherry, 3-4-coccous, covered with a dense thick stratum of tawny scurfy-tomentose soft prickles; seeds small, black, indistinctly wrinkled.

Hab.—Upper Tenasserim.

5. **M. ricinoides,** Muell. Arg.—An evergreen shrub, all younger parts covered with a floccose tawny or rusty-coloured, rarely greyish, fugaceous tomentum; leaves ovate to orbicular-ovate, cordate or more or less peltate at the 5-nerved base, on a scurfy-floccose-tomentose petiole 2-4 in. long, acute to acuminate, 5-6 in. long and longer and nearly as broad, thick-membranous, remotely and minutely toothed or almost entire, above glabrescent or quite glabrous, beneath whitish or tawny floccose-tomentose and often somewhat scurfy, the nerves and transverse veination strong; flowers small, almost sessile, greyish tomentose, the males clustered, the females usually solitary and on the same inflorescence, forming long, floccose-tomentose, simple or compound spikes in the axils of the leaves and at the end of the branches; bracts subulate, minute; female calyx 4- or 5-cleft; ovary greyish villous-echinate; capsules almost globular, the size of a cherry, densely covered with stellately-scurfy, long, subulate, soft bristles, 3- or 4-coccous; seeds globular, slightly tubercled, black.

Hab.—Upper Tenasserim.—Fr. Feb.

6. **M. tetracoccus,** Kz.—An evergreen tree (30—40 + 15—20 + 3—4), the young shoots white or tawny from a minute scurfy tomentum; leaves broadly ovate to ovate, almost sagittately produced at the truncate 5-nerved base and narrowly peltate or almost not peltate, 4-12 in. long and nearly as broad, on a tawny or whitish powdery petiole 1-4 in. long, acuminate, almost entire or obsoletely sinuate-toothed, sometimes produced into 2 lateral lobes, chartaceous, glabrous above, white-velvety and indistinctly gland-dotted beneath, the transverse net-veination prominent; flowers shortly pedicelled, the males clustered, the females solitary, with minute lanceolate bracts, forming shortly white- or tawny-tomentose racemes collected in a more or less ample terminal panicle; female calyx 5-cleft; ovary warty and densely puberulous; capsules globular, the size of a large pea or small cherry, tubercled-muricate,

densely and shortly whitish tomentose, usually 4-coccous; seeds oblong, black-brown, obsoletely and minutely tubercled.

HAB.—Chittagong.

7. **M. paniculatus,** Muell. Arg.—An evergreen tree (30—40 + 12—20 + 4—5), the young parts shortly white or tawny- (rarely rusty-) tomentose; leaves more or less rhomboid-ovate, shortly peltate or rounded or obtuse at the narrowed 3- or almost 5-nerved base, on a puberous petiole 1-2½ in. long, often produced into 1 or 2, rarely 4, more or less acute or acuminate lobes, entire or obsoletely repand-toothed, thick-membranous or pergamaceous, glabrous above, white or rarely tawny-velvety beneath; flowers small, the males on slender but short pedicels and clustered, the females almost sessile, forming long, shortly white or tawny-tomentose spikes or racemes arranged into terminal, lax, rather slender panicles; female calyx irregularly 4-3-parted; ovary densely stellate-tomentose and softly muricate; capsules small, 3-coccous, the cocci of the size of a pepper-kernel or somewhat larger, tawny or whitish velvety-prickly; seeds small, almost globular, black, obsoletely tubercled.

HAB.—Not unfrequent along choungs in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim.—Fl. Oct.-Nov.—s.—SS.=*SiS.* Metam.

8. **M. Roxburghianus,** Muell. Arg.—An evergreen tree (20—25 + 8—10 + 2—3), often remaining shrubby, all softer parts softly but loosely pubescent; leaves orbicular-ovate to ovate, broadly peltate and usually 9-nerved at the rounded and somewhat truncate base, abruptly and thinly acuminate, on a puberulous petiole 1 to 3 in. long, 4-6 in. long and nearly as broad, chartaceous or membranous, repand-toothed, on both sides (above minutely) pubescent, beneath glandular-dotted, the transverse veination prominent; flowers small, greenish, shortly pedicelled, the males clustered, the females solitary, supported by linear pubescent bracts, forming terminal, simple, greyish or tawny-pubescent racemes; ovary warty and hirsute; capsules 3-coccous and 3-lobed, shortly hirsute and glandular, intermixed with short, hairy, subulate bristles, the cocci of the size of a very small pea; seeds globular, smooth.

HAB.—Rather rare in the tropical forests of Martaban, east of Toungh̄oo; also Chittagong.—Fl. Apr.-May; Fr. Aug.—s.—SS.=Metam.

9. **M. acuminatus,** Muell. Arg.—An evergreen large shrub, 8-12 ft. high, the young parts shortly puberulous; leaves ovate-oblong to broadly oblong, shortly peltate and often sinuate at the 3- to several-nerved base, rarely not peltate at all and almost cordate, on a puberulous petiole ½-3 in. long, 3 to 5 in. long, rather abruptly acuminate, slightly repand- or sinuate-toothed, chartaceous, glabrous

or nearly so, or more usually shortly pubescent along the midrib and nerves beneath, the transverse veination thin; flowers on very short puberulous pedicels, the females on thicker ones and solitary, the males clustered, both forming puberulous racemes at the end of the branchlets or of the axillary shoots; female calyx remaining for a longer time flask-like closed, usually 3-4-lobed, puberulous; styles higher up connate, indistinctly puberulous or glabrous; ovary crimson, densely muricate from soft sparingly and minutely hispid bristles; capsules 3-coccous, indistinctly yellowish puberulous and copiously yellow-glanded, covered with reddish, almost glabrous, soft bristles, the cocci almost globular, the size of a small pea; seeds almost globular, smooth, white and brown variegated.

Hab.—Frequent in the tropical forests of the Andamans.—Fl. March-Apr.; Fr. May-June.—s.

10. **M. Helferi,** Muell. Arg.—An evergreen tree (20—25+8—10+1½—2), the shoots scurfy-puberulous from short, yellowish, stellate hairs; leaves variable, from ovate-elliptical to obovate and narrow-oblong, not peltate, rounded or almost cordate at the narrowed 3-5-nerved base, on a puberulous glabrescent petiole varying in length from ½ to nearly 1½ in., shorter or longer acuminate, 2-5 in. long, thin-chartaceous, glabrous, beneath on the nerves more or less puberulous, with a tuft of hairs in the leaf-axils and minutely and sparingly gland-dotted; flowers small, greenish, the males on very short but slender puberulous pedicels and clustered, the females on thicker pedicels and solitary, forming puberulous racemes at the end of the branchlets and of the axillary shoots; female calyx membranous, spathaceously slitting; ovary densely puberulous-echinate, the style short and stiff, along with the outside of the stigmas indistinctly appressed-hispid; capsules 3-coccous, the cocci the size of a small pea, echinate and tawny-pubescent.

Hab.—Very common along choungs, etc., in the tropical forests all over Burma from Pegu and Martaban down to Tenasserim and the Andamans.—Fl. March-Apr.—s.—SS.=SiS. *Metam.*

11. **M. muricatus,** Muell. Arg.; Bedd. Sylv. Madr., 208.—An evergreen large shrub, 8 to 12 ft. high, all parts glabrous, the branchlets somewhat compressed; leaves obovate-oblong to obovate, often somewhat cuneate towards the obtuse or shortly rounded base, not palmatinerved, on a short smooth petiole varying in length from 3 to 10 lines, rather abruptly and bluntish acuminate, chartaceous, 3-6 lin. long, coarsely or obsoletely repand-toothed, glabrous, beneath dotted with golden-coloured glands, the nerves and transverse veination thin; flowers small, greenish, shortly pedicelled, the males clustered, the females solitary, forming glandular-dotted, but otherwise glabrous racemes at the end of the branchlets or of

the axillary shoots, the bracts short, ovate, acute; calyx copiously glandular-dotted, the female one soon slitting into 5 linear-lanceolate segments; ovary densely golden-glandular and muricate; capsules 3-coccous, densely golden-glandular and sparingly and shortly muricate, the cocci the size of a pea; seeds pale brown, smooth.

HAB.—Frequent in the tropical forests of the Andaman Islands.—Fl. March-Apr.; Fr. May-June.—s.—SS.=*SiS.* Metam.

ALCHORNEA, Sw.

Flowers dioecious, rarely monoecious. Calyx in males 4-(rarely 3-2-) parted and valvate, in females 6-5- rarely 4-parted or -cleft and imbricate in bud. Petals none. Disk in males none, in females sometimes developed. Stamens rather numerous or only 8-4, usually in 2 alternate rows, the filaments only at the base ring-like connate; anthers 2-rimose, extrorse or introrse, the cells free from the base to about their middle. Ovary-rudiment none or obsolete. Ovary 3- or rarely 2-celled, with a single ovule in each cell; styles as many as ovary-cells, free or shortly united at the base, entire or 2-cleft. Capsule 3-1-coccous, dry. Seeds without spermaphore, more or less tubercled-rough. Cotyledons elliptical, usually hard, as long as the radicle.—Shrubs or small trees, with alternate, simple, 3-5-plinerved leaves, at the base 2-6-glandular and often produced into 2 narrow spurious stipules. Stipules usually subulate. Flowers small, the males often clustered and in interrupted, simple or branched spikes, the females forming simple racemes or spikes in the axils of the leaves or at the end of the branches.

Leaves elongate-obovate-oblong, short-petioled; capsules almost glabrous . . . . . *A. rugosa.*
Leaves more or less ovate, long-petioled; capsules lenticellate-muricate, indistinctly and shortly tomentose . . . . *A. tiliæfolia.*

1. **A. rugosa,** Muell. Arg.—An evergreen shrub (?), the young branchlets and shoots puberulous; stipules long, subulate; leaves elongate-obovate-oblong, rounded or obtuse at the narrowed base and bearing here 3-4 orbicular glands in the lowest nerve-axils, on a puberulous petiole ½ to nearly an inch long, shortly and rather abruptly bluntish acuminate with a mucro, 2 to 5 in. long, thin-chartaceous, crenate-serrate, glabrous, or beneath on the midrib indistinctly puberulous; flowers small, the females sessile or nearly so, forming a terminal almost glabrous or sparingly appressed-hispid spike at the end of the branches or axillary; female calyx 4-parted, the lobes lanceolate, pale tawny-puberulous; ovary densely tawny-puberulous, the 3 styles thick and flat, simple, nearly twice as long as the ovary; capsules almost sessile or spuriously peduncled,

3-coccous, the cocci of the size of a small pea, minutely appressed-pubescent, glabrescent.

HAB.—Upper Tenasserim; tropical forests of the Andamans.—Fl. Apr.

2. **A. tiliæfolia,** Muell. Arg.—An evergreen shrub, the young shoots puberulous; leaves broadly ovate to ovate-rhomboid, acute or almost truncate, and spuriously 2-stipuled at the 3- or almost 5-nerved base, bearing 1 to 3 large flat glands in the lowest nerve-axils, shortly acuminate, on a puberulous glabrescent petiole 1-3 in. long, repand-toothed, 4-6 in. long, thin-chartaceous, while young puberulous, soon glabrescent, except on the nerves beneath; flowers small, the males clustered, in slender, puberulous, interrupted spikes arising by 2-3 from the axils of the leaves or from above the scars of the fallen ones, the females on very short, thick, densely puberulous pedicels or almost sessile, forming simple terminal spikes or the lower flowers often collected into short, lateral, involucred spikelets; ovary shortly tomentose and minutely muricate, the styles long, simple, connate at the base; capsules oblong, 3-coccous, almost sessile, or the lower ones spuriously peduncled, lenticellate-muricate and indistinctly puberulous, about $\frac{1}{3}$ in. long, crowned with the long styles.

HAB.—Tenasserim or Andamans.

MACARANGA, Pet. Thouars.

Flowers dioecious. Calyx in males valvate, in females imbricate in bud. Petals and disk wanting. Stamens usually fewer than 15, rarely 1-3 only, inserted on a central, convex or plano-convex receptacle; anthers almost peltately dorsifix, 3-4-celled, the connective incomplete, shorter than the cells. Ovary-rudiment none. Ovary 6-2-celled, with a single ovule in each cell. Capsule dry or coriaceous, 6-2-coccous, armed or unarmed. Seeds albuminous, without a spermaphore; cotyledons broad, much longer than the radicle.—Trees or shrubs, with alternate, often peltate, simple leaves. Flowers in panicles, racemes or spikes, rarely in involucred long-peduncled heads.

* *Leaves ample, broadly peltate at base; capsule unarmed.*

× Female flowers and capsules shorter or longer pedicelled. Inflorescence a panicle.

Bracts minute, broadly ovate, acute, shorter than the flower-clusters; capsules usually 2-coccous . . . . . *M. denticulata.*

Bracts linear, in the males with a fleshy discoid gland terminating in a subulate appendage, in the females the gland often wanting; capsules 1-coccous . . . . . *M. Indica.*

× × Male flowers in panicles, females in simple spikes, sessile.

Bracts leafy, toothed or pectinate, acuminate, 2-4 lin. long, without gland, in females larger; capsules 2-3-coccous, subulate-prickly . . . . . *M. Tanarius.*

* * *Leaves not peltate.*

× Male flowers in bractless panicles, females forming a terminal long-peduncled bracted head.

Branchlets glabrous; leaves minutely pubescent, more or less ovate; bracts lacerate-toothed; styles ½ an in. long; capsules 2-coccous, red-glandular and laxly subulate-muricate . . *M. membranacea.*

Leaves oblong, glabrous; bracts entire; styles an in. long; ovary almost glabrous . . . . . *M. Andamanica.*

× × Male flowers in leafy but small-bracted slender panicles; females unknown.

Branchlets and leaves densely puberulous; flowers 2-androus; panicles lax and slender, large . . . . . *M. minutiflora.*

Leaves glabrous, opaquely glaucescent beneath; flowers monandrous; panicles dense and crowded, small . . . . *M. populifolia.*

1. **M. denticulata,** Muell. Arg.—*Toung-hpek-wam.*—An evergreen tree (40—60 + 15—30 + 5—8), the young parts densely and shortly tawny- or rusty-tomentose, the glabrescent branchlets pruinous; leaves more or less ovate and broadly peltate, many-nerved at the somewhat truncate-rounded base, on a fugaceously floccose finally pruinous petiole 1½-3 in. long, 4-12 in. long and nearly as broad (in young plants up to 2 ft. long, 3-lobed, membranous and pubescent beneath), thick-chartaceous or almost coriaceous, entire, or distantly and minutely toothed from the excurrent nerves, above indistinctly downy-rough, beneath pale-coloured and densely but minutely puberulous and covered with minute yellowish-red glands, the nerves and transverse parallel veination prominent; flowers minute, the males minute, sessile, in small clusters supported by a minute, broadly ovate, acute bract, tawny pubescent outside, arranged into a tawny floccose-tomentose, more or less glabrescent and pruinous short-peduncled panicle arising from the axils of the leaves or from above the scars of the fallen ones; female flowers on short thick peduncles, solitary or by 2-3, with similar bracts as the males, and forming similar panicles; stamens 14-9; ovary densely yellowish-glandular, unarmed and glabrous, 2-celled; capsules 2- or by abortion 1-coccous, the cocci of the size of a pepper-kernel, yellowish- and waxy-glandular, glabrescent, unarmed.

Hab.—Frequent in the tropical forests from Arracan, Pegu, and Martaban down to Tenasserim.—Fl. March-Apr.—s.—SS. = *Metam.* SiS.

Remarks.—Wood red-brown, adapted for cabinet-work. Exudes a red resin.

2. **M. Indica,** Wight; Bedd. Sylv. Madr., 211, t. 287.—An evergreen tree (50—60 + 20—30 + 6—11), the young parts covered with a tawny or rusty-coloured fugaceous tomentum, the branchlets strong and glabrescent, glaucescent; stipules large, ovate-oblong, acute, fugaceously tomentose; leaves more or less orbi-

cular-ovate or ovate, peltate at the rounded or rarely slightly truncate many-nerved base, on a glabrescent petiole 3 to 6 in. long, shortly acuminate, almost coriaceous, ½-1 ft. long and nearly as broad, entire or slightly repand-toothed, glabrous above, shortly but softly pubescent and brown-gland-dotted beneath; flowers minute, the males sessile in dense clusters, supported by a linear bract bearing a large disk-shaped gland (looking like a lichen-apothecium) and subulately appendaged, the female flowers on rather long pedicels, supported by similar linear bracts with a terminal gland, but without the appendage, both sexes forming rusty or tawny-puberulous, more or less glabrescent, short-peduncled panicles in the axils of the leaves and above the scars of the fallen ones; stamens 8-5; ovary usually 1-celled, glandular, the style subulate, flexuose; capsules 1-coccous, reniform-globular, the size of a pepper-kernel or somewhat larger, unarmed, fugaceously glandular.

Hab.—Not unfrequent in the tropical forests of the Andaman Islands.—Fl. May.—s.—SS. = SiS. Metam.

Remarks.—Exudes a red resin similar to that of *M. denticulata.*

3. **M. Tanarius,** Muell. Arg. (*M. molliuscula,* Kz.)—An evergreen middling-sized tree, all younger parts softly and shortly pubescent; stipules large, linear-oblong, acuminate; leaves more or less orbicular-ovate, on a glabrescent glaucescent petiole 3 to 4 in. long, broadly peltate and many-nerved at the rounded or somewhat truncate base, ½ to 1½ ft. long and nearly as broad, more or less distinctly and shortly sinuate-toothed, shortly acuminate, membranous or nearly so, softly and minutely puberulous or almost glabrous above, beneath yellow-gland-dotted, and more or less densely and softly puberulous or rarely glabrescent, the transverse net-veination thin; flowers small, both sexes sessile, the males clustered and protected by a broadly oval to ovate, acuminate, toothed or pectinate leafy bract 2-4 lin. long, forming peduncled, rather slender, puberulous panicles in the axils of the leaves or above the scars of the fallen ones, the females solitary, furnished with a cuneate-oblong, often 3-lobed, serrate-toothed or fimbriate, leafy, shortly tomentose bract about ¼-⅓ in. long, and forming puberulous, simple, interrupted spikes; anthers 5-6; ovary shortly and appressedly hispid, 2-3-celled; styles 2, subulate; capsules 3-2-coccous, the size of a large pea, yellowish-resinous-glanded, sparingly beset with long, subulate, soft prickles.

Hab.—Not unfrequent in the tropical forests of the Andamans.—Fl. Apr.—s.—SS. = Metam. *SiS.*

Remarks.—Exudes a reddish resin.

4. **M. minutiflora,** Muell. Arg.—A shrub, all softer parts more or less shortly pubescent; leaves more or less ovate, not peltate,

rounded or truncate-rounded at the 3-5-nerved base, on a densely puberulous petiole 1-2 in. long, long-acuminate, callose-repand-toothed, 2-4 in. long, membranous, above shortly puberulous or rough and sparingly gland-dotted, beneath gland-dotted and more or less densely puberulous, the nerves and parallel transverse venation thin; male flowers minute, sessile, clustered, furnished with a pectinate-toothed, ovate-lanceolate, leafy, acuminate, pubescent bract 3-4 lin. long, forming slightly branched, slender or almost filiform, greyish puberulous, interrupted, panicled or sometimes simple spikes in the axils of the leaves or above the scars of the fallen ones; stamens usually 2 only.

HAB.—Tenasserim.

5. **M. populifolia,** Muell. Arg.—An evergreen tree, the young shoots greyish puberulous; stipules lanceolate, acuminate, puberous or puberulous; leaves ovate to elliptically lanceolate, on a slender thinly puberulous petiole 2-3 in. long, rounded at the base, $2\frac{1}{2}$-4 in. long, bluntish and rather abruptly acuminate, membranous, glabrous or indistinctly puberulous on the nerves beneath, opaquely glaucescent and minutely and densely resinous-dotted on the under-surface; flowers minute, densely clustered, bracted and forming short glabrous or almost glabrous sessile or shortly peduncled rather compact panicles in the axils of the leaves and much shorter than the petiole; bracts broadly 3-angular-ovate, concave, cut, the lower basal ones blunt, entire, greyish puberulous; stamen 1; capsules didymous, the cocci the size of a large pepper-kernel, densely yellow-resinous, very sparingly and minutely tubercled.

HAB.—Tropical forests of the Andamans.

6. **M. Andamanica,** Kz.—An evergreen small tree, all parts glabrous; stipules minute, subulate; leaves oblong to linear-oblong, at the narrowed base auricled-rounded, on a rather strong petiole very variable in length ($\frac{1}{3}$-$1\frac{1}{2}$ in.), acuminate, remotely callose-repand, chartaceous, 2-5 in. long, glabrous, beneath resinous-dotted in the reticulations; female flowers solitary or few, within 2 leafy bracts, on a slender stiff peduncle in the axils of the leaves and usually as long or somewhat shorter than them; involucre-bracts ovate, sessile, about an inch long, bluntish to bluntish acuminate, entire; ovary apparently glabrous, the styles an inch long.

HAB.—Tropical forests of the Andamans.—Fl. R.S.

7. **M. membranacea,** Kz.—A small, erect, almost simple shrub branched upwards, 2-4 ft. high, the young parts puberulous, the branchlets glabrescent and glaucescent-fuscous; stipules small, linear; leaves ovate to almost oblong-ovate, not peltate, somewhat truncate or almost sinuate at the 3-nerved rounded base, on a

slender puberulous petiole 1-3 in. long, 2 to almost 4 in. long, simple or sometimes produced into 1 or 2 lateral long-acuminate lobes, remotely callose-toothed, very long and slender, acuminate, while young on both sides reddish-gland-dotted and minutely and almost velvety puberulous, or almost glabrous above, the nerves and transverse parallel veination thin; male flowers unknown; female flowers sessile, solitary or by 2 or 3, supported by a leafy, ovate, acuminate, lacerate-toothed puberulous and gland-dotted bract $\frac{1}{2}$-$\frac{3}{4}$ in. long, forming an involucred head at the end of an 1-3 in. long pubescent peduncle arising from the axils of the leaves; calyx urceolate, the tubular limb embracing the style-base, greyish pubescent; ovary reddish glandular and hirsute, the 2 styles $\frac{1}{2}$ in. long, filiform, glabrous; capsules 2-coccous and 2-lobed, the cocci of the size of a small pea, reddish gland-powdered and laxly covered with filiform, flexuose, smooth, soft bristles; seeds spherical, brown, smooth and glabrous.

Hab.—Not unfrequent in the drier hill forests, especially the pine forests, of Martaban, at 4,000 to 6,000 ft. elevation; also Ava hills.—Fr. Sept.—SS.= Metam.

CLEIDION, Bl.

Flowers dioecious. Calyx 3-5-parted, valvate in the males, imbricate in the females. Petals and disk none, or rarely the latter developed in the females. Stamens numerous, free, clustered and crowded on the central conical receptacle; anthers peltately attached, 4-celled, the connective usually produced beyond the cells. Ovary-rudiment none. Ovary 2- or 3-celled, with a solitary ovule in each cell; styles as many as ovary-cells, filiform, 2-cleft or 2-parted, minutely papillose on the inner face. Capsule 2- or 3-coccous. Seeds without arillus or spermaphore; cotyledons large, much longer than the radicle.—Trees, with alternate simple leaves and subulate stipules; male flowers in racemes, the females solitary in the axils of the leaves.

Male flowers slenderly pedicelled; petiole 2-3 in. long . . . *C. Javanicum.*
Male flowers sessile; petiole 2-4 lin. long . . . . . *C. nitidum.*

1. **C. Javanicum,** Bl.; Bedd. Sylv. Madr. t. 272.—An evergreen tree (30—40+12—20+3—4), all parts quite glabrous; bark grey, corky-verrucose, even, about 1-2 lin. thick; cut dry, greenish or brown; leaves lanceolate to obovate-oblong, acute at the base, on a slender 2-3 in. long petiole, thick-chartaceous, repand-toothed, 6-8 in. long, glabrous; male flowers small, on slender sparingly and minutely hispid pedicels, usually by 2 to 5 together, forming slender almost glabrous racemes in the axils of the leaves; female flowers much larger, on a very long pedicel thickened upwards, soli-

tary in the axils of the leaves; ovary slightly puberulous, the styles and their branches unusually long; capsules on a 3 to 4 in. long peduncle, usually 3- or 2-coccous, about an inch in diameter, glabrous; seeds almost spherical, smooth, white-variegated, the size of a large pea, opaque.

HAB.—Frequent in the tropical forests, from Chittagong and Martaban down to Tenasserim and the Andamans.—Fl. Feb.-March; Fr. May-June.—s. —SS.=*Metam.* SiS.

REMARKS.—Wood uniformly white or yellowish, rather heavy, fibrous, but close-grained, soft, takes good polish, but is perishable.

2. **C. nitidum,** Thw.—An evergreen small tree, all parts quite glabrous; leaves broadly to elliptically lanceolate, on a strong 2-3 lin. long petiole, acuminate at both ends, repand-toothed from about the middle, 2-3½ in. long, thin-coriaceous, glabrous, fuscescent in drying, glossy; male flowers small, glabrous, sessile, few together clustered, forming a glabrous or indistinctly puberulous, elongate, simple spike of the length or longer than the leaves and arising at the end of the branchlets opposite to the end-leaf; calyx glabrous, globular in bud.

HAB.—Rather rare in the tropical forests of South Andaman.—Fl. Apr.-May.—s.

BLUMEODENDRON, Kz.

Flowers dioecious. Calyx of the males valvate, 3-parted. Petals none. Disk in the males gland-like. Stamens numerous, free, on an elevated central receptacle. Ovary-rudiment none. Ovary 3-celled, with a solitary ovule in each cell. Capsule large, fibrous-woody, 3-2-coccous. Seeds large, enveloped in a spurious thick arillus. Albumen soapy; cotyledons leafy, almost orbicular, the radicle short.—Trees, with opposite or usually whorled simple leaves. Flowers rather small, the males in short cymes clustered in the leaf-axils or more usually above the scars of the fallen leaves.

1. **B. Tokbrai,** Kz.—An evergreen tree (40—60+15—25+4—6), all parts glabrous; leaves obovate to obovate-oblong, on a 1-1½ in. long petiole jointed and thickened at the apex, obtuse and often shortly contracted at the 3-nerved base, 4-6 in. long, shortly and abruptly acuminate or apiculate, coriaceous, quite glabrous, entire, opaque, without visible veins between the strong nerves; flowers rather small, glabrous, pedicelled, in short racemes; hypogynous glands minute, thick, orbicular-ovate; filaments free; capsules almost globose, 2- or 3-coccous, divided by an elevated line, about 1-1½ in. across, fibrous-woody, brown, glossy; seeds purple, covered with a thick spurious arillus; albumen soapy.

HAB.—Rather frequent in the tropical forests of the Andamans.—Fr. March-Apr.—s.—SS.=SiS.

COELODISCUS, Baill.

Flowers dioecious. Calyx valvate, in the males 4-5-parted, in the females 3-5-cleft. Petals none. Hypogynous disk none or developed. Stamens numerous, on a depressed-concave receptacle or round a central disk, free or variously and shortly polyadelphous; anthers 2-rimose, the connective not produced. Ovary-rudiment none. Ovary 5-3-celled, with a solitary ovule in each cell; styles as many as ovary-cells, simple, papillose. Capsule 5-2-coccous, dry. Seeds almost globular, shortly arillate.—Shrubs, with alternate or opposite simple leaves 3- to 7-nerved at the base. Flowers small, in axillary clusters, short spikes or racemes, the flower-buds always apiculate.

* *Flowers pedicelled or sessile, in elongate racemes or spikes.*

Flowers sessile, in elongate interrupted spikes . . . . . *C. eriocarpoides.*

Flowers on long pedicels, in racemes . . . . . *C. longipes.*

* * *Flowers sessile, in clusters or very dense short spikes.*

○ *Leaves pubescent on both sides.*

Capsules the size of a cherry, densely and softly muricate, the soft pubescent prickles about 3 lin. long . . . . . *C. lappaceus.*

○ ○ *Leaves glabrescent or almost glabrous.*

Petiole 1-3 in. long; branched shrub . . . . . *C. glabriusculus.*

Petiole 4 to 12 in. long; simple-stemmed low shrub . . . *C. hirsutulus,*

1. **C. eriocarpoides,** Kz.—An evergreen shrub, all softer parts tawny puberulous; leaves obovate to ovate-oblong, acute or obtuse or rarely shortly and narrowly rounded at the more or less conspicuously 3-nerved base (the 2 lateral basal nerves almost marginal), on a puberulous petiole ½ to nearly 1½ in. long, acuminate, 3 to 6 in. long, membranous or chartaceous, obsoletely or rarely coarsely repand-toothed or almost entire, glabrescent above, softly and shortly pubescent and glandular-dotted beneath, the nerves and transverse veination prominent; flowers small, the males clustered and shortly pedicelled, forming long, tawny or rusty puberulous racemes in the axils of the leaves and at the end of the branchlets; male calyx shortly tawny-tomentose; females and fruits not known.

Hab.—Upper Tenasserim.

2. **C. lappaceus,** Kz.—An evergreen shrub, all softer parts densely and shortly stellate-pubescent; leaves opposite or nearly so, elliptically oblong to ovate-elliptical, rounded or obtuse at the 5 or almost 7-nerved base, on a shortly roughish puberulous petiole varying in length from ⅓ to 2 in., acuminate to bluntish, slightly repand-toothed and occasionally produced into 2 short acute lateral lobes, thick-membranous, 2½-4 in. long, stellately rough above, beneath shortly and densely stellate-pubescent and strongly nerved and transversely veined; flowers small, sessile or

nearly so, in short (not an inch long), tawny-tomentose, dense spikes resting on a short naked peduncle arising from the axils of the leaves; bracts longer than the flowers, conform with the stipules and linear-subulate; male sepals 5, valvate, tawny-tomentose; stamens numerous; disk none; capsules depressed-globular, the size of a cherry, pale tawny-tomentose and densely covered with long, pilose, soft, subulate prickles, 5-3-coccous.

Hab.—Ava, in the Irrawaddi valley.—Fr. Sept.

3. **C. hirsutulus,** Kz.—A leaf-shedding, low, simple-stemmed shrub or undershrub 1-2 ft. high, the compressed young branchlets hispid; leaves almost orbicular, opposite, about 5-6 in. long and nearly as broad, cordate and almost obscurely maculate at the 7-nerved base, on a pubescent petiole from 4 in. to nearly a foot long, very shortly and bluntish acuminate, almost entire or obsoletely repand-toothed, chartaceous, on both sides sparingly hispid from rather long stiff white hairs, beneath glabrescent and sparingly golden-gland-dotted (the glands soon withering and disappearing), prominently and strongly nerved; male spikes dense and short, up to ½ in. long, sessile, shortly tawny-tomentose, axillary; bracts almost linear, somewhat longer than the calyx; male calyx more than a line in diameter, sepals 3, broadly ovate-concave, globular in bud; stamens very numerous, glabrous.

Hab.—Not unfrequent in the drier upper mixed and the dry forests of the Yomah from Prome to the Irrawaddi zone of Pegu.—Fl. Feb.—l.—SS.=CaS. SiS.

4. **C. glabriusculus,** Kz.—A leaf-shedding, small, more or less branched shrub, about 2-4 ft. high, the branchlets compressed, the young shoots puberulous; leaves opposite, elliptically ovate to broadly elliptical, rounded to almost cordate at the 3- to 7-nerved base, on a minutely puberulous glabrescent petiole 1 to 3 in. long, bluntish to acute and apiculate, 2-6 in. long, chartaceous, entire or nearly so, or minutely toothed from the excurrent nerves, shortly hirsute along the midrib above and sparingly so beneath, otherwise glabrous, not glandular-dotted, the nerves and transverse veination thin but prominent; male flowers small, glabrous and orange-coloured inside, tawny-tomentose outside, sessile, in small globular or oblong spikes or clusters in the axils of the leaves and above the scars of the fallen ones; sepals 3, 3-angular-ovate, acute; stamens numerous, glabrous.

Hab.—Frequent in the upper mixed forests, especially the drier ones, along choungs chiefly, on the Pegu Yomah and in Martaban.—Fl. Jan.-March.—l.—SS.=*SiS.* Metam.

5. **C. longipes,** Kz.—A leaf-shedding low shrub, 1 to 2 ft. high, with a strong thick root, the young shoots shortly and densely

soft-pubescent, the older branchlets compressed, slightly pubescent; leaves opposite, variable, from almost orbicular to obovate-elliptical, rounded or rarely almost cordate at the 9- to 5-nerved base, on a pubescent glabrescent petiole ½-3 in. long, abruptly acute or slightly acuminate, 3-4 in. long and sometimes nearly as broad, membranous, while young pubescent beneath and stellate-puberulous on the nerves and veins, more or less glabrescent, the nervation thin; flowers orange-yellow, on pubescent pedicels of 1 to 2 and even more inches length, forming pubescent racemes arising from the base of the stem or from the axils of the leaves or from above the scars of the fallen ones; calyx of both sexes tawny-tomentose, 3-cleft, the segments 3-angular-ovate; stamens very numerous, glabrous; ovary muricate and stellately hispid, 3- or 2-celled; stigmas 3 or 2, sessile, crimson-papillose; capsules resting on the elongate 2-4 in. long peduncle, 3- and 2-coccous, minutely but densely tawny-stellate-hispid, shortly muricate, the cocci of the size of a pea; seeds almost spherical, dull-brown and opaque, with a white fleshy aril at the base.

Hab.—Frequent in the drier upper mixed, the Eng and dry forests, from Ava and Martaban down to Pegu.—Fl. Jan.-March; Fr. March-Apr.—l.—SS.= CaS., SiS. *Dil.*

HYMENOCARDIA, Endl.

Flowers dioecious, the males in catkin-like spikes. Calyx 5-parted or rarely 5-7-toothed, persistent, valvate in bud. Petals and disk wanting. Males: stamens 5 or numerous; filaments at the base united round an ovary-rudiment; anthers ovoid, 2-rimose. Females: ovary 2-celled, more or less compressed, with a solitary ovule in each cell; styles 2, long, simple, papillose. Capsule samaroid-compressed, reniform-cordate to obcordate, 2-celled. Seeds compressed, without caruncle or arillus, the testa thin. Albumen scanty. Cotyledons membranous, the radicle slender.—Trees or shrubs, the young parts more or less orange-gland-dotted, with simple leaves. Male flowers in densely bracted catkin-like spikes, the females solitary or in poor cymes or racemes.

Leaves 1-2½ in. long; male spikes up to ½ in. long; stamens . . *H. Wallichii.*
Leaves 3-5 in. long; male racemes up to 6 in. long; stamens numerous . . . . . *H. plicata.*

1. **H. Wallichii,** Tul.—*Ye-kin.*—A tree (15—25+3—6+1—3), often remaining a shrub of 6-10 ft. high, leafless in H.S., the young parts appressed golden pubescent and covered with discoid, orange-coloured scales; leaves elliptical to oblong and ovate-oblong acute, bluntish and blunt, on a slender puberulous petiole up to ½ in. long, rounded or obtuse at the base, 1-2½ in. long, above almost

glabrous, beneath golden-lepidote and puberulous, chartaceous; male spikes densely lepidote, puberulous, yellow, up to ½ in. long, solitary or by 2-3 from the axils of the leaves or from above the scars of the fallen ones, the females shortly pedicelled, in poor pubescent racemes; ovary much compressed, the long styles crimson papillose; capsules very flat-compressed, twice as broad as long, nerved, brown, glossy, nearly ½ an in. long.

HAB.—Common in the swamp forests and along the marshy borders of choungs in the savannahs, from Pegu and Martaban down to Tenasserim.—Fl. March-Apr.; Fr. Apr.-May.—s×l.—SS.=All.

REMARKS.—Wood rather heavy, of unequal fibre, pale brown, then red-brown, close-grained, rather hard and brittle.

2. **H. plicata,** Kz.—*Ye-chin.*—A tree (40—50+8—12+4—6), shedding leaves in H.S., the young shoots rusty puberulous; bark grey; leaves from oblong and elliptically oblong to oblong-obovate, on a shortly puberulous petiole about an inch long or longer, rounded to almost cordate at the 3-nerved often somewhat narrowed base, 3-5 in. long, shortly and abruptly bluntish acuminate, crenate-repand, chartaceous, beneath puberulous on the nerves and densely covered with minute yellowish or reddish gland-dots; flowers dioecious, the males on very short puberulous pedicels, clustered, forming elongate racemes in the axils of the leaves or above the scars of the fallen ones, while young bracted and catkin-like, the females sessile, solitary, forming similar elongate simple spikes; male calyx globular in bud, almost glabrous; stamens free, numerous; ovary 2-merous, compressed, densely gland-dotted, transversely wrinkled, the 2 styles short and large, densely papillose-villous.

HAB.—Frequent in the swamp forests and in swampy depressions of the savannah forests of the alluvial plains of Pegu and Martaban down to Tenasserim.—Fl. Feb.-March.—s×l.—SS.=All.

REMARKS.—Wood □′=35; break-weight=153-170 pd.

CLAOXYLON, A. Juss.

Flowers dioecious or occasionally monoecious. Calyx valvate in bud, in the males 3- or rarely 4-, in the females 3- to 2-parted. Petals none. Disk-glands usually free, or united in a disk. Stamens 6 to very numerous, free, on a central elevated receptacle; anthers erect, 2-rimose. Ovary-rudiment none. Ovary 3- to 2- or 4-celled, with a solitary ovule in each cell; styles as many as ovary-cells, simple and rather short, papillose-stigmatic, rarely almost smooth. Capsule 3- or rarely 2-4-coccous, fleshy-coriaceous and indurating. Seeds arillate, the arillus pure white or scarlet.—Shrubs or undershrubs, rarely trees, with stipuled, alternate, simple leaves.

Flowers small, forming axillary simple or branched racemes or spikes.

* *Capsule minutely or conspicuously puberulous or velvety, rarely glabrous*

Capsules peduncled, contracted in a short stalk, greyish puberulous . . . . . *C. longifolium.*

* * *Capsule densely covered with soft pubescent or hirsute prickles.*

Leaves penninerved, scabrous, but not hairy . . . . . *C. longipetiolatum.*

Leaves ample, 3- or almost 5-nerved at base and strongly veined, hispid-rough above, stellate-pubescent beneath . . . *C. leucocarpum.*

1. **C. longifolium,** Baill.—An evergreen shrub or small tree, 4 to 10 ft. high and higher, with hollow stem, the young shoots appressed silky puberulous and roughish; leaves oblong-lanceolate to lanceolate, on a rough petiole ½-1½-2 in. long, penninerved, acuminate or acute at the base, 2½ to 6 in. long, abruptly acuminate, repand-toothed or crenate-serrate, rough, thick-membranous, more or less minutely puberulous beneath; flowers small, greyish pubescent, the males forming axillary, longer, slender, the pedicelled females shorter, greyish pubescent racemes in the axils of the leaves; capsules 3-coccous, narrowly contracted at the base, on a 1-2 lin. long peduncle, the size of a large pea, densely and minutely greyish puberulous.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah, also frequent on the Andamans.—Fl. Apr.-May.—s.—SS.=*SiS.* Metam.

2. **C. longipetiolatum,** Kz.—An evergreen meagre shrub or small tree 8 to 15 ft. high, with a fistulose stem, the young shoots appressed-pubescent; leaves elliptical to ovate-oblong, acute, obtuse, or rarely almost cordate at the base, on a 3 to 5 in. long petiole, abruptly and shortly but finely acuminate, 4-8 in. long, thick-membranous, waved-crenate or slightly crenate-toothed, penninerved, rough on both sides, slightly appressed-pubescent on the nerves beneath; flowers small, the males in nodding appressed greyish hispid racemes; capsules deeply 3-lobed, covered with soft hirsute prickles, crowned by the simple papillose-fimbriate styles, 3-coccous, the cocci of the size of a pea.

Hab.—Frequent in clearings and open places, and chiefly along choungs, in the tropical forests of the Pegu Yomah and Martaban.—Fl. Apr.-May.—SS. =*SiS.* Metam.

3. **C. leucocarpum,** Kz.—An evergreen, meagre, low shrub, 3 to 4 ft. high, with a hollow stem, the young shoots stellate-pubescent; leaves ample, broadly ovate, rounded or almost cordate at the strongly 3- or almost 5-nerved base, on a shortly pubescent glabrescent petiole 3 to 8 in. long, about a foot long and nearly as broad, shortly and rather bluntish acuminate, repand-toothed,

membranous, above rough from short, stiff, often stellate hairs, beneath shortly stellate-pubescent, the nerves and transverse veination strong and prominent; female flowers shortly pedicelled, forming short stellate-tomentose racemes in the axils of the leaves; calyx stellate-tomentose, the female one unequally 2-sepalled; ovary densely covered with soft stellate-hispid prickles; capsules on a puberulous strong peduncle 2-3 lin. long, the size of a small cherry, 3- or rarely 2- or 4-coccous and -lobed, white, fleshy-coriaceous, crowned by the thick papillose-fringed styles; seeds almost globular-ovoid, smooth, the size of a small pea, enveloped in a nearly complete snow-white sappy arillus.

Hab.—Rare in the tropical forests and along choungs in the upper mixed forests of the Pegu Yomah.—Fr. Jan.—s.—SS.=SiS.

ACALYPHA, L.

Flowers monoecious or polygamous. Calyx in males 4-parted and valvate in bud, in the females 3-5-parted, slightly imbricate. Petals and disk in both sexes wanting. Stamens normally 8, free, on a cushion-like receptacle; anthers 2-rimose, the cells almost serpentine, free, suspended from the apex. Ovary-rudiment none. Ovary 3-celled, with a solitary ovule in each cell; styles 3, free or shortly connate at the base, simple, jagged or rarely entire. Capsule dry, 3-coccous and 3-celled, usually supported and surrounded by the more or less conspicuous bracts. Seeds with a more or less distinct spermaphore, albuminous. Embryo straight, the radicle nearly as long as the ovate cotyledons.—Shrubs or undershrubs, rarely herbs, with alternate, simple, penninerved or 3-7-nerved leaves. Stipules paired. Flowers minute, clustered, in dense catkin-like spikes often reduced to clusters, the males usually in the upper bracts.

1. **A. fruticosa,** Forsk.—A leaf-shedding branched shrub, 4-8 ft. high, all softer parts greyish puberulous; leaves ovate-oblong to ovate, more or less rounded or acute and 3- or almost 5-nerved at the base, on a slender glabrescent petiole ½ to an in. long, acuminate to acute or rarely blunt while young, 1-2 in. long, membranous, roughish above, softly puberulous beneath; flowers minute, greenish, clustered, sessile, forming slender, puberulous, sessile spikes arising singly or by 2-3 from above the scars of the fallen leaves, the females at the very base of the spike or in separate small cluster-like few-flowered spikes in the axils of the young leaves; bracts of both sexes rotundate and toothed while in bud, turning broadly ovate, acute, concave, minutely greyish pubescent outside; ovary appressed greyish pubescent, the styles simple, many-cleft, about 2-3 times longer than the floral bracts.

Hab.—Frequent along choungs in the tropical forests of the eastern slopes of the Pegu Yomah and Martaban, up to 2,000 ft. elevation ; also Ava, Kakhyen hills.—Fl. March.—l.—SS.=SiS. *Metam.*

TRAGIA, Plum.

Flowers usually monoecious. Calyx in males 5-3-parted and valvate, in the females 6-5- (rarely 8-3-) parted and imbricate in bud, usually much enlarged in fruit, involucre-like and stingingly hispid. Petals none. Disk developed or not. Stamens 1 to 40, free, or the inner ones more or less connate, round a minute ovary-rudiment, or the latter wanting ; anthers 2-rimose, dorsifix, the connective not produced. Ovary 3- rarely 5-celled, with a solitary ovule in each cell ; styles 2-5, connate below, simple, more or less papillose on the inner face. Capsule dry, 1-3- or rarely 5-celled. Seeds globular, without spermaphore. Arillus none.—Shrubs or herbs, usually twining or scandent, with alternate simple leaves. Stipules paired. Flowers small, in racemes terminating axillary shoots and appearing leaf-opposed after the fall of the leaves, the females at the base of the inflorescence.

Leaves more or less pubescent ; female calyx-lobes pinnatifid ; seeds glabrous . . . . . *T. involucrata.*
Leaves large, almost glabrous ; female calyx-lobes entire ; seeds velvety-tomentose . . . . . *T. Burmanica.*

1. **T. involucrata,** Jacq.—An evergreen twining undershrub, 4-6 ft. high, all parts more or less covered with stiff stinging hairs ; leaves ovate-lanceolate to ovate, acute or obtuse at the 3-nerved base, on a hispid-pubescent petiole $\frac{1}{4}$ to nearly an in. long, acuminate, coarsely serrate, 1 to 3 in. long, membranous, on both sides (especially beneath) more or less covered with stiff stinging hairs ; flowers small, yellowish, sessile, the females basal, forming peduncled, short, stinging-hirsute spikes at the end of the young shoots in the axils of the leaves or opposite to them ; female calyx-lobes lacerate-pinnate, hirsute ; ovary densely hispid ; capsules 3-coccous, the size of a pea, hirsute, supported by the marginally pinnatifid hirsute calyx-lobes of nearly the length of the capsule itself ; seeds ovoid-globular, small, glabrous, greyish mottled, black at the hilum.

Hab.—Not unfrequent in shrubbery around villages and along the margins of forests of Lower Pegu.—Fl. Fr. C.S.

2. **T. Burmanica,** Kz.—A large twining shrub, the young parts appressed-puberulous ; leaves large, cordate-ovate, on a greyish appressed-puberulous petiole 1 to 3 in. long, sinuate-cordate at the 5-nerved base, shortly and abruptly acuminate, thin-chartaceous, remotely and minutely toothed or almost entire, 2 to 5 in.

long, above sparingly beset with stiff white bristles, otherwise glabrous or nearly so ; flowers unknown ; peduncles solitary from axillary shoots, slender, 2-3 in. long, puberulous ; calyx-lobes in fruit broadly ovate, leafy, acute, nearly an inch long, densely (outside more sparingly) appressed long-bristly ; capsules 3-coccous, the cocci the size of a large pea, appressed long- and stiff-hirsute, woody, supported by the enlarged 6-leafed calyx ; seeds globular, velvety, beautifully dark-brown mottled.

HAB.—Not unfrequent in the tropical forests of Martaban east of Tounghoo.—Fr. Apr.-May.—s.—SS.=Metam.

CNESMONE, Bl.

Flowers monoecious. Calyx 3-cleft or -parted, the male valvate, the female imbricate in the bud. Petals and disk none. Stamens 3, free, round an ovary-rudiment, alternating with the calyx-segments ; anthers 2-rimose, the connective long-exserted beyond the anther-cells and jointed-incurved. Ovary 3-celled, with a solitary ovule in each cell ; styles very thick, connate below, simple, trigonous, toothed-marginated, erect, and forming, so to say, an obovoid head larger than the ovary itself. Capsule dry, 3-coccous. Seeds almost globular, with a jagged arillus.—Twining shrubs, with simple alternate leaves. Flowers in rather short racemes with a few female flowers at their base, at the end of axillary shoots.

1. **C. Javanica,** Bl.—An evergreen large twining shrub, all parts densely and softly but stingingly pubescent ; leaves oblong-ovate, cordate at the 3- or nearly 5-nerved base, on a densely pubescent petiole ½ to 1½ in. long, shortly acuminate, 3-5 in. long, serrate-toothed, membranous, softly pubescent on both sides ; flowers small, the males on short velvety pedicels and smaller, arranged in a rather short tawny-pubescent or villous raceme at the end of the shoots or young branchlets in the axils of the full-grown leaves and therefore appearing axillary, the females at the base of the raceme, sessile or nearly so ; female calyx 5-6 lin. long, velvety ; ovary densely strigose-hirsute ; capsules 3-coccous, supported by the velvety, leafy, rhomboid-ovate, entire or coarsely crenate, acuminate sepals which are nearly as long as the capsule itself, the cocci roundish, the size of a small pea, covered with stiff fragile hairs.

HAB.—In the tropical forests above Rangoon.—Fl. Jan.—SS.=Lat. p.

DALECHAMPIA, Plum.

Flowers of both sexes included in a 2-leaved compressed involucre. Calyx in males 4-5-parted, valvate in females, 5-12-

parted, imbricate in bud. Petals none. Disk none, or rarely rudimentary in the females. Stamens numerous, or rarely few, situated on an elevated central receptacle, the filaments united in a column; anthers 2-rimose, longitudinally adnate. Ovary-rudiment none. Ovary 3- or 4-celled, with a solitary ovule in each cell; styles united into a column, entire, or more or less lobed at the summit. Capsule 3-4-coccous, dry. Seeds without spermaphore. Cotyledons ovate, complanate.—Shrubs, usually scandent or twining, with alternate penni- or palmati-nerved, simple-lobed or digitate leaves. Stipules paired. Flowers clustered within the leafy involucre, terminating a longer or shorter axillary peduncle.

1. **D. scandens,** L.—An evergreen large twining shrub, the younger parts more or less pubescent; leaves deeply 3-lobed, 5-nerved at the cordate base, on a pubescent petiole 1-2 in. long, chartaceous, 2-4 in. long, the lobes more or less lanceolate, acuminate, usually obsoletely serrate; flowers sessile, bracted, in a large leafy involucre at the end of a 2-3 in. long, puberulous, spuriously axillary peduncle; involucre-leaflets cordate-ovate, 3-lobed almost to the middle, serrulate; bracts of female flowers entire; calyx-lobes of females pinnatifid-cut, hirsute; ovary shortly tomentose; capsules the size of a pea, 3-coccous, smooth, crustaceous-woody.

Hab.—Not unfrequent in the tropical and moister upper mixed forests of the southern parts of the Pegu Yomah; entering also the toungyas.—Fr. Jan. —s : l.—SS.=SiS.

RICINUS, L.

Flowers monoecious. Calyx 5-parted, both sexes valvate in bud. Petals and disk wanting. Stamens very numerous, united into many botryomorph bundles arranged on a plano-convex receptacle; anthers 2-celled, globular-didymous, dorsifix. Ovary-rudiment none. Ovary 3-celled, with a solitary ovule in each cell; styles 3, connate below, 2-parted, papillose. Capsule dry, 3-coccous. Seeds with a spermaphore. Albumen copious, oily. Cotyledons large, the radicle short.—Trees or shrubs, with alternate, palmati-lobed, peltate leaves. Flowers rather small, in racemes or contracted panicles bearing the females at the lower part. Bracts membranous, subulate, small.

1. **R. communis,** L.; Brand. For. Fl., 445.—*Kyek-su-pen.*—An evergreen shrub or treelet (15—20 + 8—12 + 1—1½), flowering already in the first year of growth while still herbaceous, all parts glabrous, the softer branchlets pruinous; leaves peltate and palmati-lobed, on a ¼ to a foot long petiole, membranous, about ½ to 2 ft. in diameter, glabrous, the lobes oblong-lanceolate or narrower, acute or acuminate, usually doubled-gland-serrate; flowers pedicelled, rather large, forming a simple or more usually panicled pruinous raceme

at the end of the branchlets; capsules echinate or rarely unarmed, ovoid-globular, varying in size from that of a cherry to nearly an inch long, 3- rarely 4-coccous; seeds oblong, smooth, variegated.

HAB.—Generally cultivated all over Burma, and often like wild in rubbishy places round villages, in deserted toungyas, and more especially along river banks.—Fl. Fr. C.S.—s×l.—SS.=∞.

REMARKS.—Yields a white resin. The castor-oil is derived from the seeds, which make also valuable oil-cakes; they are also used by dyers for fixing colours. A sort of silkworm is fed upon its leaves.

HOMONOYA, Lour.

Flowers dioecious. Calyx of males 3-parted and valvate, of females 5-parted and imbricate in the bud. Petals and disk none. Stamens very numerous, united into many botryomorph bundles and central; anthers 1-celled, adnate, opening by a short slit, almost globular. Ovary-rudiment none. Ovary 3- rarely 4-celled, with a solitary ovule in each cell; styles 3 or rarely 4, shortly connate at the base, simple and narrow, papillose. Capsule usually 3- occasionally 4-coccous, dry. Seeds without spermaphore, but with a spurious arillus, smooth.—Shrubs or small trees, with simple alternate leaves and deciduous stipules. Flowers of both sexes in axillary spikes or racemes, or the females solitary.

1. **H. riparia,** Lour.; Bedd. Sylv. Madr., 212, t. 24, f. 1; Brand. For. Fl., 445.—*Mo-ma-kha.*—An evergreen branched shrub from a few to 6 ft. high, the young parts greyish pubescent; leaves linear to linear-oblong, acute at the base, on a puberulous petiole 2-3 lin. long, 3-6 in. long, more or less acuminate, minutely and obsoletely (often glandular-) serrulate-toothed, almost coriaceous, glabrescent or almost glabrous above, beneath densely and shortly greyish puberulous and glandular-scaly, or more usually almost glabrous and densely glandular-scaly; flowers of both sexes sessile, in axillary greyish pubescent spikes; calyx of males indistinctly puberous or glabrous, of females greyish pubescent; capsules 3-coccous, the size of a pepper-kernel, greyish velvety-tomentose; seeds small, brown.

HAB.—Very frequent in and along the rocky or pebbly beds of streams and streamlets in all forests of Burma, from Ava and Chittagong down to Tenasserim.—Fl. C.S.; Fr. H.S.—l.—SS.=Metam. *SiS.*, etc.

MANIHOT, Plum.

Flowers dioecious. Calyx in both sexes imbricate, the female one deciduous. Petals none. Disk in both sexes developed and urceolate. Stamens 10, free, in 2 series, inserted on the flat receptacle round the disk; anthers 2-rimose. Ovary-rudiment present or its place empty. Ovary usually surrounded by 10

staminodes, 3-celled, with a solitary ovule in each cell; styles 3, very short, connate; stigmas broad, 3-lobed, the lobes shortly 2-lobed. Capsules 3-coccous, the cocci 2-valved. Seeds with a strong spermaphore. Cotyledons broad.—Herbs or shrubs, rarely trees, sometimes tuberose, with alternate usually palmati-lobed leaves. Stipules paired. Flowers rather conspicuous, in corymb-like panicles.

1. **M. utilissima,** Pohl.—*Pooloo-pinan-myouk.*—An evergreen simple-stemmed or sparingly branched shrub 6-10 ft. high, with a large tuberous root up to 3 ft. long, all parts quite glabrous and somewhat glaucous; stipules lanceolate-subulate, very deciduous; leaves deeply 3-7-lobed (occasionally the one or other leaf quite simple and palmately 3-nerved), on a 2-10 in. long petiole, membranous, 3-8 in. across each way, glabrous, more or less glaucescent beneath, the lobes oblong-lanceolate to elongate obovate-oblong, entire, acuminate; flowers greenish white or reddish, on slender pedicels, forming terminal, glabrous, pruinous, corymb-like panicles; calyx glabrous, in males 1-2, in the females up to 4 lin. long; disk in males scarlet; capsules globular-ellipsoid, the size of a cherry, wrinkled-rough.

Hab.—Generally cultivated with Burmans and Karens, especially in toungyas.—Fl. R.S.

Remarks.—This is the tapioca, maniok or cassava, the roots of which are poisonous, but when cooked furnish wholesome food.

JATROPHA, L.

Flowers usually monoecious. Calyx 5-parted, in both sexes imbricate in the bud. Petals in both sexes present or not. Glands of disk opposite the calyx-lobes. Stamens 30 to 10, in 6 to 2 whorls, central; filaments connate at the base; anthers 2-rimose, the cells free below. Ovary-rudiment none. Ovary surrounded by 8 to 10 staminodes, 3- or rarely 4-2-celled, with a solitary ovule in each cell; styles as many as ovary-cells, connate at the base, simply or twice 2-cleft. Capsule dry, 2-4-coccous. Seeds with spermaphore. Cotyledons broad, complanate, palmati-nerved, the radicle short.—Shrubs or small trees, sometimes herbaceous, with alternate, simple or palmati-lobed leaves usually long-petioled. Stipules in pairs. Flowers often in terminal, dichotomously branched, corymb-like panicles bearing the females in the forks of the branchings.

Leaves not peltate, angular-lobed, the lobes and stipules entire . *J. curcas.*
Leaves not peltate, palmately lobed, the lobes glandular-toothed, the stipules long-glandular-bristly . . . . . *J. glandulifera.*
Leaves not peltate, digitately multifid, the lobes entire or lobed, the stipules long, hair-like lacerate, without glands . . *J. multifida.*

1. **J. curcas,** L.; Brand. For. Fl., 442.—*Thin-baw-kyek-su.*—An evergreen treelet (20—25 + 8—10 + 1—2), the trunk irregular, the young shoots minutely tomentose, soon glabrescent; bark grey, smooth; leaves broadly cordate, not peltate, 7- to 5-nerved at the truncate or sinuate-rounded base, on a 3-6 in. long petiole, angular, 5- or rarely 3-lobed, sometimes entire, up to 6 in. across each way, membranous, glabrous, the lobes entire, the lateral ones acute or blunt, the terminal one usually shortly acuminate; flowers yellowish, on rather short pedicels, forming fugaceously floccose rather small corymb-like panicles on 1-2 in. long peduncles arising from the axils of the leaves or spuriously terminal; calyx glabrous or slightly puberulous; petals about 2 lin. long, yellowish; stamens 10, in 2 series, the filaments of the outer ones far down free; ovary smooth; styles 3, shortly 2-cleft; capsules 3-coccous, the size of a large cherry, fibrous-woody, smooth; seeds large, somewhat compressed-ellipsoid.

Hab.—Generally cultivated with the Burmans, especially as a hedge tree round gardens and villages, sometimes found as an escape in rubbishy places.—Fl. Fr. ∞.—s.—SS. = ∞. *All.*

Remarks.—Wood soft, spongy, white, yields a resin.

2. **J. glandulifera,** Roxb.—An evergreen treelet (4—8 + 1—2 + ¾—1), with a thick unequal trunk, all parts glabrous; stipules many-cleft, long-glandular-bristly; leaves not peltate, palmately 3-5-lobed, on a sparingly but strongly glandular-muricate petiole 2-3 in. long, membranous, glabrous, about 3-5 in. long and broad, the lobes acute or shortly acuminate, minutely and densely glandular-toothed; flowers greenish yellow, on very short pedicels, forming axillary or terminal, more or less glandular-pubescent, peduncled, corymb-like panicles bearing the females in the forks; bracts glandular-bristly; calyx sometimes glandular-ciliate; petals united at their base, about 2 lin. long; capsules ovoid-oblong, the size of a cherry-stone, 3-coccous and slightly 6-lobed, glabrous, minutely granular.

Hab.—Not unfrequent in rubbishy places round villages and along river banks, from Chittagong and Ava down to Arracan and Pegu, more frequent in the drier parts of Ava.—Fl. Fr. ∞.—l.—SS. = ∞. *All. CaS.*

Remarks.—Yields a resin.

N.B.—*J. multifida,* L., with many-cleft leaves and crimson inflorescence, is very generally cultivated round monasteries and in Burmese gardens.

OSTODES, Bl.

Flowers dioecious. Calyx 5-parted, in both sexes imbricate in bud. Petals of both sexes developed and imbricate. Hypogynous

glands alternating with the petals. Stamens more or less numerous, free, on a central convex receptacle; anthers 2-rimose. Ovary-rudiment none. Ovary usually 3-celled, with a solitary ovule in each cell; stigmas 3, sessile, simple. Capsule woody, 3- or 2-coccous. Seeds without arillus or spermaphore.—Trees, with alternate, simple, penninerved leaves. Flowers usually in axillary panicles.

Leaves not distichous; flowers panicled . . . . *O. paniculata.*
Leaves distichous; flowers in axillary clusters . . . *O. Helferi.*

1. **O. paniculata,** Bl.—An evergreen tree (50—60+15—25+4—6), all parts glabrous; bark ½ in. thick, brown, tubercled; cut pale-coloured; leaves elliptically ovate to ovate-oblong, obtuse at the 3-nerved base, on a slender petiole 1½ in. to nearly a foot long, acuminate, callose-repand-toothed, membranous, glabrous, somewhat pale-coloured beneath; flowers yellowish white, rather small, on jointed 1-2 lin. long pedicels, forming more or less ample minutely pubescent or almost glabrous panicles arising singly or usually by pairs from the axils of the leaves or from above the scars of the fallen ones; calyx smooth; petals orbicular, pubescent at the base inside; ovary silky-pubescent; capsules depressed-globular, about an inch in diameter, 3-coccous, woody, with a somewhat fleshy epicarp, glabrous; seeds large, glossy, obsoletely keeled on the back.

Hab.—Not unfrequent in the damp hill forests and the tropical forests of Martaban east of Tounghoo, at 2,000 to 3,000 ft. elevation.—Fl. March.—s.—SS.=Metam.

Remarks.—Wood rather heavy, of an unequal fibre, but close-grained, white, turning yellowish, rather soft.

2. **O. Helferi,** Muell. Arg.—Branchlets densely verrucose-lenticellate, glabrous or the extremities and the very young leaves appressed-pubescent, but soon turning glabrous; leaves obovate-lanceolate, on a 1½-3 in. long petiole, obtuse at the base, 7-10 in. long, shortly cuspidate-acuminate, entire, coriaceous, membranous, glabrous, the veination thin; flowers small, on short pedicels distichously bracted at the base, by 6-10, forming fascicles shorter or hardly longer than the petiole; male calyx usually 6- rarely 5-parted, nearly 1½ lin. in diameter, the lobes ovate, acute; petals in males rigid, pubescent; male receptacle rather densely crisped-pilose; female flowers and fruit unknown.—(After Muell. Arg.)

Hab.—Upper Tenasserim.

CODIAEUM, Rumph.

Flowers monoecious. Calyx usually 5- rarely 3-parted, in both sexes imbricate in the bud. Disk developed, outside the stamens.

Petals alternating with the sepals, rarely absent or rudimentary in the females. Stamens varying in number, free, inserted on the central elevated receptacle; anthers 2-rimose. Ovary-rudiment none. Ovary 3-4-celled, with a solitary ovule in each cell; styles 3-4, terete, connate at the base, simple or 2-cleft or 2-parted. Capsule 3-4-coccous, dry. Seeds with a spermaphore.—Shrubs or trees, with opposite or alternate simple penninerved leaves. Flowers small, usually in axillary elongate or umbel-like racemes.

Flowers in elongate racemes; ovary glabrous, the styles simple . *C. variegatum.*
Racemes corymbose, glabrous; ovary hirsute, the styles 2-cleft . . . . . *C. Andamanicum.*
Umbels from a pubescent-bracted head on a pubescent axillary peduncle . . . . . *C. (?) lutescens.*

1. **C. variegatum,** Bl.—An evergreen shrub, 4-8 ft. high, all parts glabrous; leaves variable, from oblong to elongate-linear, obtuse or acute at the base, on ½-1 in. long petiole thickened at the apex, 2-6 in. long and longer, blunt to bluntish apiculate, almost coriaceous, entire or waved, glabrous, green or variously variegated; flowers rather small, slenderly pedicelled, forming glabrous elongate racemes in the axils of the leaves; calyx 5-parted, glabrous; petals shorter than the calyx, rudimentary, white; hypogynous glands in males orange-coloured, almost crescent-shaped, in females connate, annular; stamens numerous, free; ovary glabrous; styles 3, long, simple, subulate.

Hab.—Frequently cultivated in villages, especially round khyoungs, all over Burma.—Fl. begin. of R.S.—s.

2. **C. Andamanicum,** Kz.—An evergreen large shrub, all parts glabrous; leaves from obovate-oblong to elliptical, acute or obtuse at the base, on a 3-10 lin. long petiole, shortly and bluntish acuminate, 3-6 in. long, chartaceous, entire, glabrous; flowers small, the males on capillary 3-4 lin. long pedicels, forming a very slender umbel- or corymb-like raceme, the females somewhat larger, on very short thick pedicels, in small almost sessile corymbs, btoh inflorescences at the end of the young often axillary shoots; calyx-lobes rounded, glabrous, those of the females ovate, acute; petals in males small, the hypogynous glands large, trigonous, truncate, fleshy; stamens in several series; ovary appressed pale-hirsute; styles 3, very long, deeply 2-cleft; capsules on a short nodding peduncle thickened upwards, globular-3-coccous, the size of a small cherry, indistinctly roughish, woody-coriaceous; seeds ovoid-elliptical, silky-grey and variegated.

Hab.—Very frequent in the tropical forests of the Andaman Islands.—Fl. Fr. Apr.-June.—s.—SS.=SiS.

3. **C. (?) lutescens,** Kz.—An evergreen large (dioecious ?) shrub, 8-12 ft. high, the young shoots slightly puberulous; leaves lanceo-

late, occasionally somewhat falcate, acuminate at the base, on a puberulous glabrescent petiole 2-3 lin. long, bluntish acuminate, chartaceous, glabrous, penninerved, yellowish in a dried state; male flowers minute, on capillary 2-3 lin. long pedicels, umbelled from a globular pubescent-bracted head terminating the puberulous $\frac{1}{3}$-$\frac{1}{4}$ in. long peduncle, arising solitary from the axils of the leaves or from above their scars; calyx 3-parted, slightly imbricate in bud, the lobes ovate-lanceolate, about $\frac{1}{2}$ lin. long, acute, shortly appressed-hispid outside; stamens about 8-12, inserted round a smooth yellow centre within a rather broad continuous (5-lobed?) disk; petals none; female flowers, etc., unknown.

Hab.—In bamboo jungles on Middle Andaman along Middle Straits.—Fl. April.

TRIGONOSTEMON, Bl.

Flowers monoecious. Calyx 5-toothed or -parted, imbricate in bud. Petals present or suppressed. Stamens indefinite or definite, in 1 or more whorls on a central receptacle not elevated; anthers 2-rimose. Ovary-rudiment none. Ovary 3-celled, with a solitary ovule in each cell; styles 3, connate at the base, once or twice dichotomously branched. Capsule 3-coccous, dry. Seeds without spermaphore or arillus.—Trees or shrubs, with simple alternate leaves; stipules in pairs. Flowers minute, in axillary racemes, spikes or clusters.

* *Inflorescence appressed-tawny hirsute; leaves very shortly and thick petioled; ovary tawny hirsute* . . . . *T. longifolium.*

* * *Inflorescence minutely greyish puberulous or almost glabrous; leaves on long and slender petioles.*

Female calyx-lobes deeply glandular-fringed; ovary glabrous . *T. heteranthum.*

Female calyx-lobes minutely ciliate, not glandular; ovary appressed-pubescent . . . . . *T. lætum.*

1. **T. longifolium,** Baill.—An evergreen small tree or shrub, the young shoots tawny or yellowish appressed-hirsute; leaves elongate obovate-oblong or oblong-linear, narrowed at the base and acuminately decurrent on the short pubescent petiole, $\frac{1}{2}$-$1\frac{1}{2}$ ft. long, slighly crenate-gland-toothed, acuminate, chartaceous, sparingly pubescent while young, soon glabrescent above and more or less so beneath, or puberulous or pubescent along the nerves; flowers small, on short hirsute pedicels, forming a simple tawny appressed-hirsute raceme in the axils of the leaves; calyx-lobes about a line long, entire, appressed-hirsute; petals obovate, glabrous; ovary tawny-hirsute; styles short, shortly 2-lobed.

Hab.—Tenasserim.

2. **T. heteranthum,** Wight.—A shrub, the leaf-buds and very young shoots pale tawny-pubescent; leaves lanceolate to broadly

lanceolate, on a 2-4 in. long petiole thickened at the apex, obtuse at the base, long-acuminate, 4-7 in. long, chartaceous, remotely and obsoletely repand-toothed or entire, glabrous; flowers rather small, on capillary pedicels up to ½ in. long, forming a very slender minutely puberulous raceme or raceme-like panicle in the axils of the upper leaves; lobes of male calyx ovate or obovate, entire, those of the female triangular-ovate, long-acuminate, glandular-fringed; hypogynous glands in both sexes free; petals obovate; ovary glabrous, the styles shortly 2-lobed.

Hab.—Tenasserim.

3. **T. lætum,** Baill.—An evergreen shrub, all parts glabrous, the leaf-buds minutely tawny-pubescent; leaves lanceolate to broadly or oblong-lanceolate, on a 1-2 in. long petiole thickened at the apex, obtuse at the base, obsoletely and remotely repand-toothed, 4-6 in. long, thick-chartaceous, long-acuminate, glabrous; flowers shortly pedicelled, in elongate, minutely pubescent, rather robust spike-like racemes springing from the axils of the leaves; calyx greyish appressed-pubescent, the lobes of the females ovate-lanceolate, minutely ciliate, entire; petals puberulous; hypogynous glands in males distinct, in females united in a 5-lobed cup; ovary greyish silky-pubescent; capsules on nearly ½ an in. long peduncles thickened upwards, depressed, about 5 lin. in diameter and half as high, glabrous; seeds almost globular, brown-variegated.

Hab.—Upper Tenasserim.—Fr. Apr.

GALEARIA, Zoll. & Mor.

Flowers dioecious. Calyx 5-parted, the lobes imbricate in bud. Petals induplicate, cochleate- or cucullate-concave. Disk in male flowers none. Stamens 10, in 2 series, surrounding the ovary-rudiment, the outer 5 alternating with the 5 inner ones; filaments connate at the base; anthers 2-rimose, the cells free. Ovary 2- or 3- celled, with a single ovule in each cell; styles 2 or 3, 2-parted. Drupe indehiscent, usually broader than long, containing a single 1-seeded stone. Albumen plenty. Embryo transverse, the cotyledons flat, the radicle small.—Small trees or shrubs, with alternate simple leaves. Stipules by pairs. Flowers small, the females usually clustered, forming elongate racemes or spikes.

1. **G. Wallichii,** Kz.—An evergreen little tree or large shrub, the younger branchlets rusty-puberulous; leaves oblong to linear-oblong, acute at the base, on a rusty-puberulous petiole 2-3 lin. long, bluntish acuminate, chartaceous, entire, 4-6 in. long, puberulous along the nerves beneath, laxly net-veined on both sides;

flowers minute, the males on about ½-1 lin. long puberulous pedicels, usually by 2-3 clustered and forming a slender, elongate, tawny or greyish puberulous raceme at the end of the branchlets; calyx tawny-pubescent; petals concave, inside with a median prominent rib, glabrous; ovary-rudiment densely white-pubescent; drupes (according to Dr. Brandis) the size of a prune, blue and pruinous, broader than long, the stone unequally wrinkled.

Hab.—Tropical forests all over Tenasserim.—Fl. March.—s.

MICRODESMIS, Planch.

Flowers dioecious. Calyx in both sexes 5-parted and imbricate in the bud. Petals in both sexes present. Disk none. Stamens 5, or if 10, in 2 series, inserted round an ovary-rudiment; anthers 2-rimose. Ovary 2-3-celled, with a solitary ovule in each cell; styles 2-3, 2-parted, lacerate-papillose. Drupe globular, bony, 2-3-celled. Seeds albuminous. Embryo straight, the cotyledons ovate, nearly as long as the radicle.—Shrubs or trees, with distichous, alternate, simple leaves minutely pellucid-dotted. Flowers minute, scarlet, pedicelled, in axillary clusters.

1. **M. caseariæfolia,** Planch.—An evergreen small tree, the young shoots and branchlets greyish pubescent; leaves lanceolate to broadly lanceolate, often somewhat oblique, acute or acuminate at the base, on a puberulous petiole 2-3 lin. long, entire or rarely indistinctly toothed, rather abruptly caudate-acuminate, 2-4 in. long, chartaceous, while young puberulous along the nerves beneath, soon glabrous and glossy; flowers minute, on slender pubescent pedicels, forming small clusters in the axils of the leaves; calyx greyish pubescent; stamens 10, in 2 series; ovary 2-celled, glabrous.

Hab.—Upper Tenasserim.

CHÆTOCARPUS, Thw.

Flowers dioecious. Calyx of both sexes decussately 4-parted, imbricate in bud. Petals none. Hypogynous glands opposite the sepals. Stamens 8-10, the filaments at the base connate in a column, pilose or villous; anthers 2-rimose, basifix. Ovary-rudiment 2-3-cleft. Ovary 3-celled, with a solitary ovule in each cell; styles 3, deeply 2-cleft, connate at the base, papillose. Capsules dry, 3-coccous, echinate or tubercled. Seeds with a 2-lobed large spermaphore. Cotyledons broad, the radicle very short.—Trees, with alternate, simple, penninerved leaves. Stipules deciduous. Flowers small, densely clustered on small, cushion-like, scaly-bracted tubercles in the leaf-axils.

1. **Ch. castaneaecarpus,** Thw.; Bedd. Sylv. Madr., t. 284.—An evergreen tree (30—40 + 12—20 + 3—4), all parts glabrous or the leaf-buds slightly appressed tawny-pubescent; leaves ovate- to oblong-lanceolate, acute or obtuse at the base, on a strong petiole 2-3 lin. long, bluntish acuminate, 3-5 in. long, entire, coriaceous, glabrous and glossy, turning blackish in drying; flowers small, on short puberulous pedicels, in small axillary clusters; ovary 3-celled, densely hispid; styles sessile, deeply 2-cleft; capsules almost globular, 3-coccous, the size of a small cherry, densely covered with rigid retrorse red-brown hispid bristles; seeds glossy black, with a fleshy 2-lobed crimson spermaphore.

Hab.—Frequent in the tropical forests, especially the open ones, from Chittagong, Pegu, and Martaban down to Tenasserim and the Andamans.—Fl. R.S.; Fr. Jan.-March.—s.—SS.=Metam. SiS. Lat. p.

GELONIUM, Roxb.

Flowers dioecious, very rarely monoecious. Calyx imbricate in bud. Petals none. Disk in males developed or often none, in females urceolate and sometimes accompanied by a few staminodes. Stamens more or less numerous, from 6-60, free, occupying the central elevated disk; anthers 2-rimose, longitudinally adnate. Ovary-rudiment none. Ovary 3-2- rarely 4-celled, with a solitary ovule in each cell; stigmas as many as ovary-cells, sessile, 3-2-cleft. Capsule fleshy coriaceous, 3-2- rarely 4-coccous, with as many seeds, or 1-seeded by abortion. Seeds enveloped in a white arillus.—Trees or shrubs, with distichous, alternate or rarely opposite, simple, penninerved leaves. Flowers usually rather small, in leaf-opposed or axillary clusters.

Stigmas large, 2-cleft, the lobes toothed; capsules 3-coccous, the size of a cherry; pedicels glabrous . . . . . *G. multiflorum.*
Stigmas minute, sessile, 2-cleft; capsules usually didymous, the size of a pea; pedicels puberulous . . . . . *G. bifarium.*

1. **G. multiflorum,** A. Juss.—*Se-than-pya.*—An evergreen tree (30—40 + 12—20 + 3—4), all parts quite glabrous; leaves lanceolate to oblong-lanceolate, acuminate at the base, on a short thick petiole, entire or sometimes sparingly serrate towards the longer or shorter acumination, 3-6 in. long, coriaceous, glabrous, usually bullate-dotted beneath; flowers rather small, greenish yellow, on glabrous pedicels 2-4 lin. long, forming fascicled short racemes opposite the leaves; calyx-lobes rounded, shortly puberulous within, coriaceous; ovary 3-celled, the 3 stigmas rather large but short, 2-cleft, many-toothed; capsules globular-3-coccous, the size of a cherry, fleshy-coriaceous, yellow or orange-yellow when fully ripe, glabrous; seeds large, enveloped in a white fleshy arillus.

Hab.—More or less frequent in the tropical forests from Arracan, Pegu, and Martaban down to Tenasserim.—Fl. Apr.-May; Fr. May-June.—s.—SS.=SiS. Metam.

Remarks.—Wood white, only fit for house-posts and similar purposes. Exudes yellow resin from the buds.

2. **G. bifarium,** Roxb.—An evergreen tree (25—30+8—12+2—3), all parts glabrous; leaves obovate to elliptical and obovate-lanceolate, acute at the base, on a very short thick petiole, blunt or bluntish, entire, coriaceous, glabrous; flowers small, on minutely puberulous pedicels about 2 lin. long, forming sessile clusters opposite to the leaves; calyx minutely puberulous, ciliolate; ovary 2- occasionally 3-celled, glabrous, the stigmas minute and very short, sessile, 2-lobed; capsules fleshy-coriaceous, usually didymous, very rarely 3-coccous, the size of a large pea; seeds globular, enveloped in a white arillus.

Hab.—In the bamboo jungles on Middle Andaman, along Middle Straits.—Fr. Apr.—s.—SS.=Metam.

BALIOSPERMUM, Bl.

Flowers monoecious. Calyx 5-parted, imbricate in bud. Petals none. Disk in both sexes developed, in the females urceolate, in the males gland-like and usually free. Stamens 15 or more, free or connate by pairs, on an elevated central receptacle; anthers 2-rimose, longitudinally adnate. Ovary-rudiment none. Ovary 3- or 4-celled, with a solitary ovule in each cell; styles 3 or 4, half-2-cleft. Capsule dry, 3- or rarely 4-coccous. Seeds smooth, with a large fleshy spermaphore. Cotyledons broad, much longer than the radicle.—Undershrubs or shrubs, with alternate, simple or lobed, penninerved leaves 2-glanded at the base. Stipules glandular, paired. Flowers small, clustered, and forming more or less bracted, compact or raceme-like panicles in the axils of the leaves or terminal, the sexes mixed, or more usually the females at the base of the inflorescence.

× Calyx not accrescent in fruit.

Disk of both sexes annular; ovary densely, the capsules minutely hirsute; leaves sinuate-lobed, glabrous (at least above) . . *B. montanum.*

Ovary densely hirsute; leaves entire, pubescent (beneath densely so). *B. reidioides.*

× × Calyx accrescent in fruit.

Hypogynous glands free; ovary slightly pubescent; capsules quite glabrous . . . . . *B. calycinum.*

1. **B. montanum,** Muell. Arg.—*Nat-cho.*—A large undershrub or small shrub up to 3 or 4 ft. high, the younger parts more or less pubescent or rarely almost glabrous; leaves very variable in size and shape (the upper ones usually smaller, narrower and shorter petioled), from oblong and elliptical to obovate- and linear-oblong, simple or more or less sinuate-3-7-lobed, rounded or obtuse at

the base, on a 1-3 in. long petiole, remotely and usually coarsely repand-toothed, membranous, from 1 or 1½ in. to nearly a foot long, acuminate, glabrous or more usually hirsute along the nerves or rarely over the whole under-surface; flowers minute, the males on capillary, the females on shorter pedicels, variously clustered in the axils of the upper leaves or of the reduced floral leaves, and forming terminal or axillary glabrous or appressed-pubescent panicles; calyx sparingly appressed-hirsute; stamens very numerous, connate by pairs; hypogynous glands in both sexes connate in a ring; ovary densely appressed-hirsute; capsules 3-coccous, the cocci obovoid, the size of a pea, minutely and fugaceously hispid; seeds elliptically obovoid, glossy, somewhat marmorated.

Hab.—Frequent in all leaf-shedding forests, especially the upper mixed and dry ones, all over Burma from Chittagong and Ava down to Tegu, up to 3,000 ft. elevation.—Fl. Fr. D.S.—l.—SS.=∞.

2. **B. reidioides,** Kz.—An erect branched undershrub, 1½-2 ft. high, all parts sparingly brown-pubescent; leaves-oblong, obtuse or acute at the 5-nerved base, on a slender, brown-puberulous petiole 1-1½ in. long, acuminate, 2-4 in. long, membranous, entire, above minutely, beneath densely and softly pubescent; flowers small, on slender pubescent pedicels, forming slender, pubescent, long-peduncled panicles in the axils of the leaves; perianth-segments lanceolate, 1½-2 lin. long, appressed-hirsute; ovary and the very young capsules densely tawny-hirsute.

Hab.—Adjoining provinces of Siam.—Fl. H.S.

CARUMBIUM, Rwdt.

Flowers monoecious, or rarely dioecious. Calyx 2-3-parted. imbricate in both sexes. Petals and disk none. Stamens 2-3, free or shortly connate; anthers 2-rimose, longitudinally adnate, Ovary-rudiment none. Ovary 2-3- rarely 4-celled, with a solitary ovule in each cell; styles as many as ovary-cells, simple or shortly connate. Capsule more or less drupaceous or berry-like, almost not or slowly capsular-dehiscing, 2-4-coccous. Seeds with a complete or incomplete spurious arillus.—Trees with alternate simple leaves. Stipules paired. Flowers small, in terminal and axillary racemes or spikes.

× Petioles bearing a gland on each side of the apex.

Leaves rhomboid-ovate, entire; capsules 3-4-coccous; seeds enveloped in a white soapy substance . . . . . *C. sebiferum.*

Leaves more or less elliptical or obovate, serrulate; drupes usually 2- or 1-coccous, berry-like, sessile . . . . . *C. insigne.*

×× Petioles without glands.

Leaves entire, more or less glaucescent beneath . . . . *C. baccatum.*

1. **C. sebiferum** (*Excoecaria sebifera*, Muell. Arg.; Brand. For. Fl., 441).—A tree (30—40+12—20+3—4), shedding leaves in H.S., all parts quite glabrous; leaves broadly rhomboid-ovate, on a slender petiole 1-2½ in. long, somewhat truncate or almost cuneate at the 2-glanded base, shortly and abruptly acuminate, 1½-2 in. long and usually somewhat broader, chartaceous, entire, glabrous, glaucescent beneath; flowers small, yellowish, shortly pedicelled, the males numerous to each broad ovate bract, the females few at the base of the terminal or rarely spuriously axillary glabrous racemes; calyx of both sexes 3-parted; stamens 3 or 2, free; ovary glabrous, the styles simple, connate at the base; capsules fleshy, when fully ripe capsular-dehiscing, 3-coccous, the size of a small cherry, smooth and somewhat glaucescent; seeds enveloped in a soapy white arillus-like mass.

Hab.—Rarely cultivated in Burma.

Remarks.—This is the Chinese tallow-tree, of which the white pulp round the seeds is used as tallow, etc.

2. **C. insigne** (*Excoecaria insignis*, Muell. Arg.; Bedd. Sylv. Madr., 214, t. 22, f. 5; Brand. For. Fl., 442).—A tree (40—50+20—25+4—6), leafless during H.S., all parts glabrous; leaves elliptically lanceolate, acute at the base, on a ½-1½ in. long petiole 2-glanded at the apex, acuminate, 3-6 in. long, chartaceous, crenate-toothed, glabrous, penninerved; flowers small, sessile, the sexes on different robust, terminal, glabrous spikes; bracts minute, the male ones several-, the female ones 1-flowered; ovary glabrous, 2-3-celled on the same or on different plants; styles 2-3, simple, thick, free to the base; drupes didymous or almost globular, 1-3-coccous, yellow, sappy, the size of a cherry-stone, smooth; seeds enclosed in a crustaceous 2-valved pyrene, the testa membranous; albumen plenty and very oily.

Hab.—Not unfrequent in the tropical forests and along choungs of the upper mixed forests of the Pegu Yomah and Chittagong.—Fr. March.—l.—SS.=SiS.

3. **C. baccatum** (*Excoecaria baccata*, Muell. Arg.).—*Le-lun-pen.*—An evergreen tree (30—40+12—20+3—5), all parts glabrous, the young branches pruinous; bark very thin, even, brown, scattered-warty; leaves ovate to ovate-lanceolate, rarely lanceolate, not glandular at the rounded or acute base, on a red slender petiole 1-2½ in. long, acuminate, entire, chartaceous, 3-7 in. long, glabrous, glaucous beneath; flowers small, pedicelled, yellowish, the males and females on separate or on the same glabrous racemes, which are simple, axillary or collected into terminal panicles; bracts broadly ovate, acute, bearing a large gland at each side, the male ones usually 3-flowered; male flowers usually dian-

drous; anthers red; ovary smooth, 2-celled; styles 2, simple and free to the base; capsules drupaceous, obovate-didymous or by abortion 1-coccous, smooth, scarlet or reddish, the size of a large cherry-stone.

Hab.—Frequent in the tropical forests all over Chittagong, Pegu, and Martaban down to Tenasserim.—Fl. Dec.-Jan.—s.—SS.=Lat. p. *SiS.* Metam.

Remarks.—Wood white, rather light, coarsely fibrous, perishable.

EXCOECARIA, L.

Flowers monoecious or rarely dioecious. Calyx 3- to 2-merous, the lobes shorter or longer, connate or quite free, or much reduced in the males, imbricate in bud. Petals and disk none. Stamens 3 or 2, free or connate, central; anthers 2-rimose, the cells longitudinally adnate. Ovary-rudiment none. Ovary 3- or 2- rarely 4-celled, with a solitary ovule in each cell; styles 2-4, simple, connate at the base, stigmatic on their inner face. Capsule fleshy or almost dry, more or less readily capsular-dehiscing, 3- or 2-coccous, the central column developed. Seeds without spermaphore or arillus.—Trees or shrubs, with usually alternate, rarely opposite, simple, penni- or palmati-nerved leaves. Stipules paired. Flowers small, usually in terminal or axillary androgynous spikes, the lower ones usually females.

* *Male flowers pedicelled; capsules woody, large.*
All parts glabrous; leaves crenate-serrate . . . . . *E. Indica.*
* * *Male flowers sessile or nearly so; capsules crustaceous, the valves opening elastically and twisting; all parts glabrous.*
× Leaves more or less repand toothed or serrate.
Leaves alternate; capsules as large as a pea . . . . . *E. Agallocha.*
Leaves opposite; capsule the size of a cherry . . . . *E. oppositifolia.*
× × Leaves quite entire, alternate . . . . . *E. holophylla.*

1. **E. Indica,** Muell. Arg.; Bedd. Sylv. Madr., 215.—An evergreen tree (20—25 + 8—10 + 3—4), all parts glabrous; bark smooth, ash-coloured; leaves oblong to elliptically oblong, obtuse or acute at the base, on a 3-4 lin. long petiole, shortly bluntish acuminate, with a mucro, 1-4 in. long, chartaceous, serrulate or crenate-serrulate, glabrous, the lateral nerves very thin and faint; flowers small, yellowish, shortly pedicelled, forming glabrous racemes at the end of the branchlets or of the axillary shoots, the females at the base and few in number; calyx 3-merous; stamens usually 3; ovary 3-celled; styles 3, long, connate at the base; capsules dry and woody, the size of a small wood-apple, almost globular, usually 3-coccous, somewhat lenticellate-roughish or smooth; seeds smooth, pale-coloured, not arillate.

Hab.—In the tidal forests of Upper Tenasserim.—Fl. Apr.—l.—SS.=Sal.

2. **E. Agallocha,** L.; Bedd. Sylv. Madr., 215; Brand. For. Fl., 442.—*Ta-yau* or *ka-yau.*—An evergreen tree (15—25+6—10+2—3), all parts quite glabrous; leaves alternate, from oblong-lanceolate to elliptically-ovate and ovate, acute or rounded at the base, on a rather slender petiole up to an inch long, bluntish to shortly bluntish acuminate, 2-3 in. long, thin fleshy-coriaceous, more or less obsoletely crenate-toothed, glabrous, glossy, penni-nerved; flowers small, yellowish green, the males sessile, much bracted and forming axillary catkin-like spikes in the axils of the leaves, the females shortly pedicelled, in sessile, axillary, shorter spikes, the lower 2-6 ones fertile, the upper ones asexual and rudimentary; male bracts imbricate, numerous, broader than long; stamens usually 3; ovary glabrous, 3-celled, the 3 styles simple and free; capsules 3-coccous, the size of a large pea, crustaceous, smooth; seeds globular.

Hab.—Very frequent in the tidal forests all along the coast of Burma, from Chittagong down to Tenasserim and the Andamans.—Fl. H.S.; Fr. R.S.—l.—SS.=Sal.

Remarks.—Wood white, soft. The juice of the whole tree very poisonous.

3. **E. oppositifolia,** Jack.; Bedd. Sylv. Madr., t. 215.—An evergreen small tree, 20 to 25 ft. high, all parts glabrous; leaves opposite, oblong to elliptically oblong, not glandular at the acute base, on a short $\frac{1}{4}$-$\frac{3}{4}$ in. long petiole, shortly acuminate, crenate-toothed, chartaceous, 3-8 in. long, glabrous, the lateral nerves thin but prominent; flowers small, yellowish, shortly pedicelled, males several to each minute bract, females solitary and axillary, or few together at the base of the rather robust, glabrous, spike-like male racemes arising at the end of the branches or from the axils of the leaves; bracts on both sides furnished with a small smooth gland; capsules 3-coccous, the size of a cherry, crustaceous, smooth; seeds smooth, without arillus.

Hab.—Upper Tenasserim.—Fr. March.

4. **E. holophylla,** Kz.—An evergreen tree, all parts quite glabrous; leaves alternate, oblong to broadly lanceolate, acute or obtuse at the base, on a 3 to 4 lin. long petiole, bluntish acuminate, chartaceous, quite entire, 3-6 in. long, quite glabrous, the arched lateral nerves thin; flowers small, sessile, the males by 3 or more, the females solitary in the bract, forming a leaf-opposed terminal spike-like glabrous raceme bearing the females at the base; bracts short and broad, furnished with a large gland at each side of the base; male flowers 2-3-androus; females and fruit unknown.

Hab.—Tropical forests of Martaban and Upper Tenasserim.

EUPHORBIA, L.

Flowers monoecious, several together in calyx-like cup-shaped involucres which are 4-5-toothed, the teeth alternating with as many horizontal glands, the latter sometimes expanded into a leafy often coloured appendage. Male flowers pedicelled, without calyx, supported by ciliate-jagged bractlets, or these sometimes obsolete, surrounding in several series the solitary central female flower. Female calyx 3-6-lobed or wanting. Ovary 3-celled, with a solitary suspended ovule in each cell; styles 3, distinct or more or less connate, 2-cleft. Capsule 3-coccous, dry. Seeds without spermaphore or arillus.—Herbs, shrubs or trees, succulent or fleshy, sometimes thorny and cactus-like, abounding in milky juice, with alternate, whorled or opposite, simple leaves. Stipules none or present. Flower-heads usually arranged into spurious umbels, clusters or cymes.

× Flowers in dichotomous cymes or rarely solitary, above the scars of the fallen leaves or supra-axillary; floral leaves absent.
○ Unarmed.
\+ Flower-heads sessile or nearly so, solitary or rarely almost ternary.
A tuberous simple-stemmed shrub, the stem terete . . . *E. sessiliflora.*
\+ \+ Flower-heads in peduncled dichotomous cymes.
Branches flattened and winged-dilated, crenate-sinuate . . . *E. epiphylloides.*
○ ○ Armed with paired, short, stipulary thorns.
† Styles 2-cleft.
Branches angular, 3-, occasionally 4- or 5-winged, the wings fleshy, sinuately repand . . . . . *E. antiquorum.*
† † Styles simple, thickened at base.
Branches more or less regularly 5-angular, the large protuberances placed serrately in sinuate, repand, longitudinal rows . . *E. neriifolia.*
Branches terete, short, fleshy tubercled . . . . . *E. Nivulia.*
× × Cymes sessile or nearly so, clustered, terminal or in the forks of the branch-whorls; floral leaves none.
Branches terete, elongate; leaves very small, linear . . . *E. Tirucalli.*
× × × Cymes several, terminal, furnished with bright-coloured (white or crimson) floral leaves.
Unarmed; leaves herbaceous, long-petioled . . . . . *E. pulcherrima.*

1. **E. sessiliflora,** Roxb.—A leaf-shedding fleshy undershrub or rather shrub, about a foot high, with a large irregularly tuberous root and terete simple stem, all parts glabrous; leaves at the extremity of the stem, alternate, obovate-oblong, sessile with an acute base, 1½-3 in. long, blunt, entire, smooth, nearly veinless, fleshy; stipules minute, gland-like; flower-heads reddish, sessile, solitary, or sometimes with 1 or 2 additional rudimentary ones, appearing above the scars of the fallen leaves; involucre shortly turbinate, the lobes rotundate-ovate, pectinately fimbriate, the glands transversely oblong; ovary glabrous; styles almost free, simple, very short, crimson.

Hab.—Pegu.—Fl. Feb.

2. **E. epiphylloides,** Kz.—A leaf-shedding tree (12—15+4—8 +1—2), fleshy, unarmed, all parts glabrous, the branches complanate and thick-winged, crenate-sinuate, terete, and narrowed at the joints; stipules minute, if any; leaves oboval, very shortly petioled, obtuse at the base, rounded or almost retuse at the apex, glabrous, glossy, the lateral nerves obsolete; flower-heads in dichotomous short-peduncled, glabrous cymes, arising from the sinuses of the crenatures on which the scars of the fallen leaves rest; capsules deeply 3-lobed, glabrous, the size and shape of those of *E. ligularia.*

Hab.—Along the rocky coast of Escape Bay, South Andaman.—Fl. Fr. May.—l.—SS.=Metam.

3. **E. Antiquorum,** L.; Bedd. Sylv. Madr., 213, t. 22, f. 4; Brand. For. Fl., 438.—*Sha-soung-pya-that.*—A tree (20—25+8—12 +1½—3), leafless in the C.S., all parts quite glabrous, the main branches more terete and obsoletely 3- to 5-gonous, the branchlets usually 3-, occasionally 4- or 5-winged-angular, the wings thick and alternately repand-sinuate, bearing on the apex of the crenatures the scars of the fallen leaves and a pair of short but sharp stipular thorns; leaves appearing in H.S., few and small, obovate-oblong, short-petioled, tapering at the base, entire, blunt or rounded at the apex, fleshy, glabrous, almost nerveless; flower-heads yellowish, the lateral ones on a rather short and thick peduncle, the central one female and sessile in the forks, forming a short-peduncled, glabrous, simply or rarely twice dichotomous, glabrous, robust cyme solitary or by pairs in the sinuses of the crenatures; bracts 2, obovate, rather conspicuous, opposite; involucre broadly hemispherical, smooth, the lobes conniving, ovate, fringed, the glands broadly reniform, rounded; ovary glabrous, the 3 styles free, shortly 2-lobed; capsules deeply 3-lobed, glabrous, the lobes compressed, about 4 lin. long.

Hab.—Frequent in the dry and upper mixed forests all over Burma, from Ava and Pegu down to Arracan and the Andamans, up to 2,000 ft. elevation. Often cultivated for hedges, etc.—Fl. Feb.-March.—l.—SS.=SiS. CaS.

Remarks.—The copious milky juice of this and the following arboreous species, hardens into Euphorbium.

4. **E. neriifolia,** L.; Bedd. Sylv. Madr., 216; Brand. For. Fl., 439.—*Sha-soung.*—A tree (15—20+8—12+2—3), leafless in C.S., fleshy, armed with solitary or paired, short, but sharp stipular thorns arising from the thick saw-like protuberances, all parts glabrous, the branches more or less regularly 5-gonous; leaves appearing in H.S., alternate, at the extremity of the branches, obovate-oblong, narrowed in a short petiole, acute or shortly acuminate, fleshy, entire, waved, 6-12 in. long, almost veinless, glabrous; flower-heads yellowish, in dichotomous, small, short-peduncled, robust cymes

arising singly or by pairs from the sinuses of the protuberances of the fallen leaves, the lateral heads very short and thick peduncled, those in the forks sessile and usually entirely male; bracts opposite, reniform, small; involucre hemispherical, smooth, 5-lobed, the lobes roundish cordate, jaggedly fringed, the glands transversely reniform-oblong; ovary glabrous and smooth, the styles high up connate, thickened at the apex; capsules glabrous, deeply 3-lobed, the cocci compressed, about 3 lin. broad.

HAB.—Frequently cultivated in Burmese villages, and probably also wild.—Fl. C.S.; Fr. March-Apr.

5. **E. Nivulia,** Ham; Bedd. Sylv. Madr., 216; Brand. For. Fl., 437.—*Sha-soung*—A tree (20—25+10—15+2—3), leafless in C.S., fleshy, all parts glabrous, the branches more or less cylindrical, armed with paired, short, but sharp stipulary spines arising from the short protuberances on which the scars of the fallen leaves are situated; leaves appearing in H.S., elongate-oblong to obovate-oblong, narrowed into a thick petiole, rounded at the apex with an indistinct point, ½-1 ft. long, entire, fleshy, glabrous, almost veinless; flower-heads yellowish, usually by 3, forming a small short-peduncled cyme arising from above the scars of the fallen leaves, the 2 lateral flower-heads on a 2-4 lin. long peduncle, the central one sessile in the forkings; bracts rather conspicuous, obovate-oblong; involucre hemispherical, smooth, the lobes large, ovate, erect, fimbriate, the glands transversely oval; ovary glabrous, the styles connate up to ½, simple, somewhat thickened at the apex; capsules glabrous, deeply 3-lobed, the lobes compressed, about 3-4 lin. long; seeds smooth.

HAB.—Frequent, especially along choungs, in the dry and drier upper mixed forests of the Prome and Pegu Yomah.—Fl. Fr. H.S.—l.—SS.=*CaS.* SiS. Aren.

REMARKS.—Wood very light, coarse-fibrous and loose-grained, yellowish, while fresh quite milky. Yields a sort of Euphorbium.

6. **E. Tirucalli,** L.; Bedd. Sylv. Madr., 217; Brand. For. Fl., 439.—*Sha-soung-lek-hnyo.*—An evergreen tree (20+4+1—2), fleshy and unarmed, all parts glabrous, the branches jointed, terete, as thick as a swan-quill or the little finger, the upper ones usually whorled; bark dark olive-brown, cracked; leaves alternate, linear or linear-cuneate, sessile, smooth, fleshy, up to ½ in. long; flower-heads sessile or nearly so, yellowish white, chiefly female, rarely hermaphrodite, crowded at the ends of the branchlets and in the forks of the branch-whorls; involucre bell-shaped, smooth, pubescent inside, the lobes short, ovate, hairy, the glands broadly kidney-shaped; ovary woolly, the styles recurved and to near the base 2-cleft, glandular-thickened at the apex; capsules deeply 3-lobed, villous-dark-brown, the lobes compressed, nearly 3 lin. long.

HAB.—Only cultivated around khyoungs, etc., in villages, especially in the Prome district.—Fl. R.S.

REMARKS.—Wood said to be strong and durable, white, tolerably close-grained, rather hard. The copious milky juice yields a sort of Euphorbium.

7. **E. pulcherrima,** Willd.—A simple-stemmed or slightly branched shrub 3-5 ft. high, all parts glabrous, the stems grey, fleshy; leaves alternate, elliptically lanceolate to ovate-oblong, acuminate at both ends, on a slender petiole 1-3 in. long, entire or occasionally sinuate-lobed, 2-4 in. long, membranous, glabrous, penninerved, somewhat glaucous beneath, the floral leaves opposite, crimson or white, somewhat shorter petioled and often narrower, but otherwise conform to the stem-leaves; flower-heads crimson, yellow or green, short-peduncled, arranged in lax, glabrous corymb-like cymes at the end of the branchlets; involucre large, bell-shaped, short-hairy within, glabrous outside, the lobes broad, very short, palmatifid, with a solitary, transversely wrinkled, fleshy gland; ovary smooth, the styles connate at the base, 2-cleft; capsules glabrous, 3-coccous and 3-lobed, the size of a small cherry, the cocci with a somewhat fleshy epicarp, keeled on the back; seeds smooth, opaque.

HAB.—Frequently cultivated in native gardens and villages, especially around khyoungs.—Fl. C.S.

PEDILANTHES, Neck.

Involucre either oblique and slipper-shaped, the inner side produced in a labellum-like appendage, or regularly urceolate, and on the back furnished with a peltate concave appendage. Glands 2-6, on the bottom of the appendage, or none. Male flowers 20-30, on long pedicels, naked, intermixed with linear-bristly often obscure bractlets. Female flower long-pedicelled, declinate, central, solitary. Ovary 3-celled, with a solitary ovule in each cell; styles 3, more or less connate. Capsules dry, 3-coccous. Seeds without spermaphore.—Shrubs, usually fleshy, with alternate simple leaves. Stipules gland-like or none. Flower-heads in axillary and terminal cymes.

1. **P. tithymaloides,** Poit.—An evergreen, low, simple-stemmed or sparingly branched, rather fleshy shrub, all parts glabrous; leaves ovate, somewhat oblique, rounded at the base, almost sessile, entire, fleshy, 1-2 in. long, glabrous, the midrib keel-like prominent beneath; flower-heads crimson, slipper-shaped, about $\frac{1}{3}$ in. long, glabrous, on a slender about a lin. long peduncles, arranged in much-scared, crowded, short, terminal cymes furnished with diminutive floral leaves; involucre glabrous, the lobes ciliolate; styles shortly

2-cleft; capsules 3-lobed, truncate at both ends, about 1½ lin. long, the cocci keeled.

HAB.—Frequently cultivated, especially in the Prome district, in villages, hedges, etc.—Fl. March-Apr.

URTICACEÆ.

Flowers unisexual or rarely polygamous. Perianth simple, consisting of 3-5 segments (rarely reduced to 1 or 2), imbricate or induplicate in the bud. Stamens as many as perianth-segments and opposite to them, very rarely fewer or more; filaments short and erect, or longer and inflexed in the bud; anthers 2-celled, the cells parallel and opening lengthwise. Ovary free or rarely more or less adnate to the perianth, 1-celled, with a solitary ovule variously attached, but the micropyle always superior; style simple, or more or less 2-cleft or 2 distinct styles, sometimes reduced to a sessile, fringed or tufted stigma. Fruit a berry, drupe, nut, or indehiscent utricle or samara, or the fruits of the whole inflorescence united in a fleshy or succulent syncarp, or the receptacle enlarging and fleshy, bearing the fruits or enclosing them. Seeds with or without albumen, the testa membranous. Embryo straight, curved, or spirally involute; cotyledons flat or folded, the radicle superior.—Trees, shrubs or herbs, sometimes climbing or epiphytic, with alternate or opposite, simple or rarely divided leaves. Stipules present, often very deciduous. Flowers small, rarely solitary, usually in clusters, heads or cymes often collected into racemes, spikes or panicles. Receptacle of the heads variously shaped, often bordered by an involucre of small bracts.

A large order containing about 120 Burmese species, most of which are woody. The wood of most trees of this order is not good and often quite valueless. An exception to this form the species of *Artocarpus*, elms, and probably some of the *Celtideæ*.

In true *Urticeæ* excessive causticity prevails, and is especially conspicuous in the stinging nettles and still more in the *Laporteas*, of which one species is called by the Malays the devil's leaf ("doun seitan"). According to Endlicher this causticity is caused by the presence of bicarbonate of ammonia. Narcotic qualities are chiefly met with in hemp and hop. Poisonous principles in a high degree occur in the juice of the Javanese upas-tree (*Antiaris toxicaria*), but also the milk of several fig-trees (like *F. toxicaria, dæmona*, etc.) is a virulent poison. Caoutchouk of superior quality is obtained from several kinds of fig-trees, chiefly *Ficus elastica* and *F. laccifera*. *Castiloa elastica* and *Cecropia peltata* yield also good caoutchouk. The cow-tree (*Brosimum*) of South America yields a copious supply of rich and wholesome milk. The tenacity of the fibre makes many species (chiefly of the sub-order, *Urticeæ proper*) important for trade

and manufacture. Such are hemp (*Cannabis sativa*) and rhea (*Böhmeria nivea*). A kind of paper is made of *Broussonetia papyrifera*. Lac is found upon several kinds of fig-trees. Edible fruits are furnished by some of the fig-trees (chiefly, however, *F. carica*), jack (*Artocarpus integrifolia*), bread-fruit (*Artocarpus incisa*), mulberry (*Morus spp.*), and a few others. The leaves of the last-named tree serve also for food of the silk-worms.

* *Style* 1, *simple; ovule solitary, erect; seeds albuminous; leaves various.*

○ Perianth free, the female one usually 4- rarely 2-parted or -lobed. Often urent. Leaves decussately opposite or spirally alternate.

Female perianth 4-parted or-lobed, dry after defloration; stigma often filiform; achene discoid, smooth; urent perennials or shrubs, often growing out into trees . . . . . *Laportea.*

○○ Female perianth free or more or less adhering or adnate to the ovary, tubular, very short or wholly wanting. Leaves opposite or alternate. Not urent.

× Female perianth tubular, free, or only adhering to the ovary, in fruit dry or membranous, the mouth conspicuously 2-4-toothed.

Stigma in fruit persistent, linear; perianth in fruit neither winged nor ribbed . . . . . *Boehmeria.*

×× Female perianth free, variously toothed or lobed at the mouth, in fruit fleshy or succulent.

Fruiting perianth ventricose, laterally contracted at the mouth; stigma capitate, persistent in fruit; flowers spicate, the spikes simply branched . . . . . *Sarcochlamys.*

××× Female perianth adnate to the ovary, the limb minute, toothed, or almost entire; fruit dry, resting in a fleshy cup; stigma almost peltate, with long-fringed borders, persistent in fruit . . . . . *Oreocnide.*

Fruit berry-like; stigma penicillate-capitate, persistent in fruit . *Morocarpus.*

** *Style usually simple, rarely* 2-3-*cleft, lobed or toothed; ovules solitary, parietal or suspended; seeds with or without albumen; pericarp enclosed in the fleshy or dry perianth, indehiscent or rarely* 2-*valved; leaves alternate or distichous.*

○ Filaments straight or nearly so in bud, never inflexed.

× Female flowers numerous, in heads or on a fleshy receptacle; the males in separate inflorescences.

Stamen 1; syncarp usually large; unarmed trees . . . . *Artocarpus.*

×× Female flowers numerous, along with the males arranged within a hollow, or on an explanate, fleshy receptacle.

Receptacle closed or at the bracted apex perforated; achenes not immersed . . . . . *Ficus.*

Receptacle explanate; achenes immersed, with ripening elastically ejected . . . . . *Dorstenia.*

××× Female and male flowers separate, the former solitary within a many-bracted involucre.

Male flowers densely packed within an imbricately bracted involucre expanding afterwards; fruit drupaceous . . . *Antiaris.*
○○ Filaments inflexed in bud.
× Flowers in dense heads or spikes.
Ovary shortly stalked; style simple; the female flowers mixed with scale-like sterile flowers; juice milky; fruits sappy . *Broussonetia.*
Ovary sessile, 2-celled; styles 2; no scale-like sterile flowers. Juice watery; perianth in fruit sappy . . . . . *Morus.*
×× Female flowers solitary or in poor racemes.
Perianth entire, enclosing the fruit, fleshy . . . . . *Balanostreblus.*
Perianth 4-parted, in fruit enlarged, fleshy . . . . . *Streblus.*
As former, but perianth in fruit leafy . . . . . *Taxotrophis.*
∗∗∗ *Style simple or styles 2; ovule solitary, suspended; no albumen; leaves alternate; fruit a drupe or samara.—Trees or shrubs.*
○ Anthers introrse; filaments inflexed in bud; fruit a drupe.
Perianth persistent; stigmas 2, persistent, linear, free or connate at base; evergreen trees, with penninerved, or at base 3-7-nerved leaves . . . . . *Sponia.*
Perianth deciduous; stigmas 2, persistent, at apex dilated-emarginate or 2-lobed; evergreen trees with 3-nerved leaves . *Solenostigma.*
Perianth deciduous; stigma simple, filiform, deciduous; deciduous trees or shrubs with 3-nerved leaves . . . . *Celtis.*
○○ Anthers extrorse; fruit a samara; leaves penninerved.
Filaments straight in bud; perianth marcescent or caducous . *Ulmus.*

LAPORTEA, Gaud.

Flowers dioecious or monoecious. Males: perianth 4- or 5-parted, the lobes glabrous or hispid. Stamens 5. Ovary rudimentary. Females: perianth 4-parted or -lobed, the segments equal or unequal, also in fruit herbaceous. Ovary erect, soon becoming oblique, with a solitary, erect or ascending ovule; stigma sessile, linear, elongate or very rarely short and oblong, shortly villous, persistent. Achene obliquely ovate or rounded, compressed, rarely ventricose. Albumen thin. Cotyledons rounded, almost truncate at the apex, the radicle short, conical.—Stinging herbs or undershrubs, sometimes shrubs or trees, with alternate, simple, entire or toothed leaves. Stipules deciduous, axillary, 2-cleft or entire. Flowers minute, often without bracts, clustered, the clusters panicled.

1. **L. crenulata,** Gaud.; Bedd. Sylv. Madr., t. 306.—*Phet-ya-kyee.*—An evergreen, erect-branched, dioecious shrub or little tree 9-12 ft. high, rather glabrous; bark smooth, ash-coloured, armed with stinging hairs; leaves ovate-oblong to oblong, $\frac{3}{4}$-$1\frac{1}{4}$ ft. long, sinuate or rounded at the unequal base, on a strong glabrous petiole $1\frac{1}{2}$-4 in. long, apiculate, membranous, obsoletely waved-crenate towards the apex or entirely entire, glabrous or sparingly stinging-hispid along the midrib beneath, the nerves arcuate, about 12-16 on each side; flowers minute, green, shortly pedicelled, forming lax, stinging-hispid, cymose panicles in the axils of the leaves;

perianth minutely stinging-bristly outside, 4-cleft; achenes unequally ovate, compressed, nearly 2 lin. long, terminated by the reflexed linear stigma.

Hab.—Tropical forests of Pegu and Tenasserim; also Chittagong.—Fl. Feb.

BOEHMERIA, Jacq.

Flowers monoecious or dioecious. Males: perianth 4-parted or -lobed, very rarely 3- or 5-parted, the segments ovate, valvate in the bud. Stamens as many as perianth-segments. Ovary rudimentary. Females: perianth tubular, compressed, or more or less ventricose, at the mouth often contracted and conspicuously 2-4-toothed. Ovary sessile or stalked, enclosed in the perianth-tube and sometimes adnate to it, with a single erect ovule; stigma elongate-filiform, continuous with the ovary, usually only the one side papillose, sometimes persistent. Achene almost conform with the ovary, enclosed in the marcescent perianth and often cohering with it; pericarp crustaceous and thin, or nut-like. Albumen never absent, but in various quantities. Cotyledons elliptical, often longer than the conical radicle.—Shrubs or small trees, rarely undershrubs, with opposite or alternating 3-nerved leaves variously toothed. Stipules axillary, deciduous, usually free, very rarely connate. Flowers minute, in small clusters, supported by short scarious bracts and forming larger clusters, spikes or cymose panicles in the axils of the leaves.

× Flowers in sessile heads or clusters, axillary or above the scars of the fallen leaves.
|| Leaves glabrous above . . . . . *B. Malabarica.*
||| Leaves sparingly hairy above.
Leaves cordate-ovate; flower-bracts numerous, large, scarious, brown; perianth 2-toothed with a solitary ovary and style . *B. Helferi.*
As former, but perianth with usually 2 ovaries and styles . *B. didymogyne.*
Leaves usually ovate to oblong-lanceolate; flower-bracts minute; perianth 2-4-toothed . . . . . *B. diffusa.*
×× Flower-heads globular, sessile, forming more or less slender often interrupted spikes in the axils of the leaves, the spikes sometimes collected along short leafless shoots in a raceme or panicle.
Leaves lanceolate, pustulate-rugate above, the pustules terminated by a perforated gland . . . . . *B. macrophylla.*
Leaves broadly ovate, smooth or rugate, without glands, more or less hairy on both sides, coarsely serrate . . . . *B. caudata.*
All adult parts, also the leaves, quite glabrous, minutely serrate or entire, usually 2-glanded at the base of the midrib . . *B. Hamiltoniana.*

1. **B. Malabarica,** Wedd.—Monoecious, very variable as to size, a much branched shrub only 2-4 ft. high, in moister localities growing up into a large shrub or shrubby treelet of 12-20 ft.

in height, the young shoots pubescent or puberulous, the stems lender, smooth, brown; leaves alternately smaller or almost equally arge, ovate-oblong to elliptically oblong, on a slender petiole varying in length from 2-3 lin. to 2 and even 3 in., rounded or somewhat cordate at the base, acuminate, 4-8 in. long or shorter, membranous, crenulate-serrate, even, or more or less rugose, glabrous above, shortly greyish pubescent beneath; stipules small, puberulous outside, very deciduous; flowers minute, greenish white, monoecious, forming densely crowded clusters in the axils of the leaves or above the scars of the fallen ones; fruiting perianth broadly elliptical or roundish, with a truncate border, minutely pubescent.

Hab.—Frequent along choungs in the tropical forests from Arracan, the Pegu Yomah and Martaban down to Tenasserim, up to 2,000 ft. elevation; freely springing up in toungyas cut in tropical forests.—Fl. Apr.-May; Fr. May-June.—l.—SS.=Metam. SiS.

Remarks.—The liber of this, and of most other Boehmerias, yields a strong fibre.

2. **B. Helferi,** Bl.—Monoecious, the young branchlets appressed-pubescent and soon glabrescent; leaves alternate, somewhat unequally large, 3-5 in. long, ovate, cordate or truncate at the base, acuminate, on a slender, puberulous, glabrescent petiole 1½-3 in. long, coarsely serrate, membranous, even, sparingly pilose above, beneath along the nerves and veins pubescent-pilose; stipules lanceolate-subulate; flowers concealed within the numerous, large, scarious, brown, obovate, somewhat acute bracts, clustered, the clusters unisexual, axillary, confluent; female perianth tubular, somewhat ventricose, 2-toothed at the somewhat hairy apex.

Hab.—Tenasserim.

3. **B. didymogyne,** Wedd.—Monoecious, the stem herbaceous, or more or less woody at the base, almost glabrous, the branchlets puberulous, glabrescent; leaves alternating, equally large, ovate, 2-4 in. long, acuminate, on a glabrous petiole ¾-2 in. long, obtuse or rounded at the base, membranous, crenate-serrate from the middle or from lower down, especially above sparingly and minutely pilose, even; stipules lanceolate, acuminate, rather persistent; flower-clusters axillary, androgynous; female perianth lanceolate, becoming finally oblong or elliptical, narrowed upwards and 2-toothed at the minutely hairy mouth, enclosing 2 more or less adnate ovaries; stigmas 2, as long as the ovary.—(After Weddel.)

Hab.—Moulmein.

4. **B. diffusa,** Wedd.—A leaf-shedding, small, meagre shrub, about 2-4 ft. high, the branches appressed-stiff-hairy; leaves large, tolerably equally or unequally ovate-lanceolate to oblong-

lanceolate, 2-4 (occasionally up to 6) in. long, long-acuminate, on a slender appressed-hispid petiole 3 lin. to 1½ in. long, acute or obtuse at the base, membranous, sharply crenate-serrate, even or wrinkled, on both sides (more so beneath) appressed-rough-hirsute; stipules linear-lanceolate, deciduous; flowers minute, sessile, forming globular small clusters in the axils of the leaves; fruiting perianth compressed, lanceolate to obovate, 2-4-toothed at the somewhat hairy apex; stigmas twice as long as the perianth.

Hab.—Frequent in the mixed and open forests, all over Burma from Ava down to Upper Tenasserim, up to 3,000 ft. elevation.—Fl. Fr. June-March.—l.—SS.=SiS. Metam. *Dil. CaS.*

5. **B. macrophylla,** Don.; Brand. For. Fl., 403.—A shrub, the ends of the branchlets minutely pubescent; leaves opposite, lanceolate, on a pubescent glabrescent petiole 1-2½ in. long (those of the alternating leaves about half the length), very long-acuminate, rounded or obtuse at the base, 3-nerved, 5-7 in. long, minutely serrate, thick membranous, pustulate-wrinkled (the pustules perforated), glabrous above, beneath minutely roughish pubescent along the nerves and veins and pale-coloured; flowers minute, sessile, in sessile globular heads of 2-3 lin. in diameter, forming a slender, appressed-hispid, more or less interrupted spike in the axils of the leaves and shorter than them; fruiting perianth narrowly obovate-cuneate, compressed, ciliate, abruptly narrowed into a short 2-4-toothed neck.

Hab.—Ava hills.

6. **B. caudata,** Poir. (not of Sw.).—A large shrub, the stems sparingly and shortly appressed-hairy; leaves opposite or the upper ones often alternating, equally or unequally large, broadly ovate, rounded or almost truncate at the base, on a slender appressed-hispid petiole varying in length from ½-3⅓ in., shortly acuminate, 4-6 in. long, sharply crenate-serrate, even or wrinkled, membranous, above glossy and sprinkled with stiff rather long hairs, beneath, especially along the veins, etc., sparingly and shortly stiff-hairy; stipules linear-lanceolate, acuminate, slightly pubescent outside; flowers minute, in small globular heads, forming solitary, more or less interrupted slender spikes in the axils of the leaves, or spurious panicles on axillary young shoots; fruiting perianth elliptical, obovate or roundish, hispid from short stiff hairs.

Hab.—Frequent in Chittagong; Ava.—Fr. Feb.

7. **B. Hamiltoniana,** Wedd.—*Sap-sha.*—An evergreen treelet (15—20+ (?) +⅓—½) or large shrub, the stems quite glabrous, the leaf-buds slightly pubescent; leaves opposite, ovate-oblong to ovate-lanceolate, acute or bluntish at the base, on a glabrous petiole 1-1½

in. long, long-acuminate, minutely toothed-serrate or entire or nearly so, 4-6 in. long, membranous, glabrous or nearly so, even, 3-nerved and bearing a gland in the basilar nerve-axils; flowers minute, sessile, in small sessile globular heads supported by a brown ovate bract, forming long, slender, pendulous, pubescent and more or less glabrescent spikes, solitary or few together in the axils of the leaves and shorter than them; styles much shorter than the fruiting perianths.

Hab.—Frequent in the tropical forests, especially along choungs of the eastern slopes of the Pegu Yomah and of Martaban east of Tounghoo.—Fl. Feb.-March.—s.—SS.=*SiS.* Metam.

Remarks.—Strong cordage can be obtained from the liber.

POUZOLZIA, Gaud.

Flowers monoecious, rarely dioecious. Males: perianth 4- or 5-lobed or -parted, rarely 3-parted, the lobes ovate and acuminate, valvate in the bud. Stamens as many as perianth-lobes. Ovary rudimentary. Females: perianth tubular, often ovate and nerved, 2-4-toothed at the contracted mouth. Ovary enclosed, usually free, rarely more or less adherent or adnate to the perianth, sessile, apiculate, with a solitary, erect or ascending ovule; stigma filiform, jointed with the apex of the ovary, villous at one side, deciduous. Achene almost conform with the ovary, surrounded by the marcescent almost unchanged perianth or its enlarged wings or ribs, the pericarp crustaceous, glossy.—Shrubs, undershrubs or herbs, with alternating or rarely opposite, entire or toothed, 3-nerved leaves. Stipules free, often persistent. Flowers minute, in axillary clusters, or the clusters arranged in spikes.

Prostrate or ascending undershrub, the leaves membranous, entire . *P. Indica.*
Shrub, the leaves serrate, chartaceous . . . . . *P. viminea.*

1. **P. viminea,** Wedd.; Brand. For. Fl., 405.—An evergreen, large, branched shrub, often growing out into a small tree 12-15 ft. high, the branchlets appressed-pubescent and more or less rough; leaves alternating and distichous, from ovate to ovate-oblong and lanceolate, obtuse or acute at the base, on a 2-5 lin. long petiole, 3-nerved, acuminate, coarsely serrate, 1½-5 in. long, chartaceous, above sprinkled with hairs, rough or smooth, beneath (especially on the nerves and veins) rough from short hairs; flowers small, pubescent, in sessile, dense, axillary clusters; male flowers 4-androus; fruiting perianth oblong-ovate, angular or obsoletely bordered, almost as long as the stigma.

Var. 1, **sanguinea proper:** leaves larger or smaller, more or less rough or almost smooth above, almost glabrous or shortly pubescent beneath.

Var. 2, **tomentosa,** Wedd. : leaves very rough above, softly pubescent-tomentose beneath.

Hab.—Var. 1 : in Chittagong.

SARCOCHLAMYS, Gaud.

Flowers dioecious. Males: perianth 5-parted, the segments ovate, blunt, imbricate in the bud. Stamens 5. Ovary rudimentary. Females : perianth shortly and unequally 4-lobed, when fully opened bell-shaped, the tube becoming afterwards gibbose and (along with the somewhat conniving lobes) lateral. Ovary broadly elliptical, oblique, stalked, enclosed in the perianth, with a solitary almost erect ovule; stigma sessile, penicillate-capitate, persistent. No rudiments of stamens. Achenes conform with the ovary, smooth, loosely enclosed in the enlarged fleshy perianth.—Shrubs or small trees, with alternate, 3-nerved, serrulate leaves. Stipules connate, 2-cleft. Flowers small, subtended by short-toothed bractlets, clustered, the male clusters in lax, the female ones in close simply branched spikes, solitary or by 2 in the axils of the leaves.

1. **S. pulcherrima,** Gaud.—*Sap-sha-pen.*—An evergreen tree (20—25 + 8—10 + ½—1), with a terete brownish stem and a divaricate crown, often branched already from the very base and hence shrubby, the branchlets minutely pubescent; bark thin, brown, with concentric swellings; leaves ovate-lanceolate to narrow lanceolate, on a greyish puberulous petiole ½-2 in. long, rounded at the base, acuminate, 4-8 in. long, chartaceous, serrate, more or less pustulate-wrinkled, glabrous above, beneath covered with a short, thin, white tomentum, 3-nerved and elegantly transversely and quadrately net-veined; flowers small, sessile, glabrous, in small clusters, forming cyme-like, branched, pubescent spikes in the axils of the leaves, as long as the petiole or a little longer.

Hab.—Rather frequent along choungs as well in the upper mixed as in the tropical forests from Chittagong, Pegu, and Martaban down to Upper Tenasserim.—Fl. Fr. R.S.—s.—SS.=SiS. Metam.

Remarks.—Wood pale reddish-brown, rather light, of a fine silvery fibre, soft. Liber a good fibre for cordage.

OREOCNIDE, Miq.

Flowers dioecious. Males: perianth 4-parted, the segments ovate, acute, valvate in the bud. Stamens 4. Ovary rudimentary. Females: perianth tubular, ventricose, adnate to the ovary, with a very small 4- or 5-toothed limb. Ovary with a solitary erect ovule; stigma nearly discoid, almost peltate, long-papillose-ciliate. Fruiting perianth ventricose, obsoletely angular-furrowed, somewhat

fleshy, firmly adnate to the nut-like achene. Albumen copious. Cotyledons elliptical, almost longer than the cylindrical radicle.—Shrubs or small trees, with entire or crenulate penni- or 3-nerved leaves. Stipules connate, 2-cleft. Flowers minute, the female ones supported by a fleshy cup (consisting of several connate bracts enlarging and finally surrounding the ripe fruit), in small peduncled clusters or heads, solitary or in dichotomous or forked, short, simple cymes in the axils of the leaves.

Leaves penninerved, entire, softly pubescent beneath . . *O. acuminata.*
Leaves penninerved, crenate-serrate towards the apex, usually pubescent along the nerves beneath . . . . . *O. sylvatica.*

1. **O. acuminata** (*Urtica acuminata*, Roxb.; *Villebrunea appendiculata*, Wedd.).—An evergreen tree (20—25+(?)+1—1½), often branched already from the base, the branchlets more or less pubescent; leaves alternate, broadly lanceolate to oblong, on a more or less pubescent petiole ½-3 in. long, abruptly and thinly acuminate, penninerved, obtuse or acute at the base, 5-10 in. long, thick-membranous, entire, glabrous and white-dotted above, more or less softly pubescent or almost glabrous beneath; flowers minute, sessile, minutely hispid, in short, pubescent, dichotomously branched cymes in the axils of the leaves.

Hab.—Chittagong; Ava hills.

Remarks.—This is the *bun-rhea* of the Assamese, which yields the fibre called China-grass-cloth.

2. **O. sylvatica**, Miq.; Bedd. Sylv. Madr., 225, t. 23, f. 4.—An evergreen small tree, 18-25 ft. high, the branchlets pubescent; leaves obovate-oblong to elliptically oblong and lanceolate, on a strong pubescent petiole ½-1 in. long, obtuse or acute at the entire base, upwards crenate-serrulate, 4-6 in. long, abruptly acuminate, membranous, penninerved, glabrous and white-dotted above, more or less pubescent along the nerves beneath; flowers minute, sessile, minutely hispid, in small heads, forming slender, simply forked or dichotomous, slightly pubescent cymes in the axils of the leaves.

Hab.—Martaban, in deserted toungyas of the Yoonzeleen, at 2,000 ft. elevation.—(Dr. Brandis.)

MOROCARPUS, Sieb. & Zucc.

Flowers monoecious and dioecious. Males: perianth 4- rarely 3-parted, the segments ovate, shortly acuminate, valvate in the bud. Stamens as many as perianth-lobes. Ovary rudimentary. Females: perianth ventricose-tubular, somewhat adnate to the ovary, 4-toothed at the contracted mouth. Ovary obovate-oblong, with a solitary almost erect ovule; stigma sessile, penicillate-capitate. Fruit berry-like, obovate, composed of the fleshy outer peri-

anth and epicarp and the inner nut-like endocarp. Albumen copious. Cotyledons small, almost roundish, of nearly the same length as the conoid radicle.—Shrubs or trees, with alternate serrate leaves white- or grey-tomentose beneath. Stipules axillary, 2-cleft. Flowers subtended by scarious bracts, sessile, the males in small clusters, the females in heads, solitary and peduncled, or forming simple dichotomous cymes.

Branchlets pubescent or tomentose; leaves lanceolate to oblong-lanceolate . . . . . *M. longifolius.*
Branchlets robust and smooth; leaves ovate to broadly ovate . *M. Wallichianus.*

1. **M. longifolius,** Bl.; Bedd. Sylv. Madr., 226, t. 26, f. 1; (*Debregeasia longifolia,* Wedd.; Brand. For. Fl., 40).—*Pwot-chaupen.*—An evergreen (?) tree (15—25 + (?) + 1—1½), the branchlets tomentose or pubescent; leaves lanceolate to oblong-lanceolate, on a pubescent petiole ½-¾ in. long, obtuse or rounded at the base, 3-5 in. long, acuminate, serrate, membranous, above rough and sparingly sprinkled with long white hairs, beneath covered with a white or grey thin tomentum, 3-nerved and elegantly transversely veined; flowers minute, sessile, in heads or clusters, arranged in short, dichotomous, puberulous cymes, solitary or by 2 in the axils of the leaves or above the scars of the fallen ones, and usually as long or shorter than the petiole.

Var. 1, **longifolius proper:** leaves lanceolate to oblong-lanceolate.

Var. 2, **latifolia:** leaves ovate to ovate-oblong, on a 1-3 in. long petiole.

Hab.—Pegu, in deserted toungyas; Ava hills; var. 2: in Chittagong.

Remarks.—The liber of this, and also of the following species, furnishes good cordage.

2. **M. Wallichianus,** Miq.—A tree (25—35 + 10—15 + 2½—3), leafless in C.S., the branchlets glabrous and pruinous, or sparingly and inconspicuously pubescent; leaves ample, ovate to broadly ovate, on a slender sometimes sparingly pubescent petiole 2-6 in. long, shortly acuminate, rounded or almost truncate at the base, sinuate-serrate, 5-8 in. long, chartaceous, glabrous above, beneath densely and shortly white-tomentose or velvety, 3-nerved at the base and penninerved; flowers minute, sessile, in small globular heads, forming rather ample, long-peduncled, puberulous or almost glabrous, dichotomously branched cymes usually solitary in the axils of the leaves.

Hab.—Rare in the moister upper mixed forests of the Pegu Yomah, at 1,000 to 2,000 ft. elevation.—s.—SS.=SiS.

MAOUTIA, Wedd.

Flowers monoecious or dioecious. Males: perianth 5-parted, the segments ovate and somewhat acuminate, valvate in the bud. Stamens 5. Ovary rudimentary. Females: perianth none. Ovary ovoid, with a solitary almost erect ovule; style short, persistent, with a nearly lateral lanceolate or almost capitate stigma. Achene ovate, somewhat compressed and sometimes bluntish 3-gonous, hispid or setose, formed by the somewhat fleshy perianth outside and the bony or nut-like seed within. Albumen thin. Cotyledons elliptical or oblong, somewhat longer than the terete slender radicle.—Shrubs, with alternating, 3-nerved, crenulate or serrulate leaves, white- or grey-tomentose beneath. Stipules axillary, usually deeply 2-cleft. Flowers minute, sessile, in small clusters or heads, collected into axillary cymes.

1. **M. puya,** Wedd.; Brand. For. Fl., 406.—A shrub, 2-6 ft. high, the branches pubescent; leaves ovate to elliptically oblong, on a pubescent petiole ½-1½ in. long, acute or cuneate at the base, 4-6 in. long, acuminate, coarsely serrate, membranous, very rough above from short minute bristles, beneath shortly white-tomentose and pubescent on the 3 principal nerves; flowers sessile or nearly so, minute, in small heads, forming short, slender, puberulous or pubescent dichotomous cymes in the axils of the leaves; achenes not beaked, somewhat appressed-hispid.

Hab.—Frequent in the drier hill forests of the Martaban hills, at 2,500 to 5,000 ft. elevation; often springing up in deserted hill toungyas.—Fr. March.—1.—SS.=Metam.

Remarks.—Yields strong fibre resembling the rhea.

CONOCEPHALUS, Bl.

Flowers dioecious. Males: perianth turbinate, tubular, 4- very rarely 2-cleft, the segments valvate in bud. Stamens 4, very rarely 2, opposite the perianth-lobes; filaments complanate; anthers short, introrse and extrorse, 2-celled, the cells opening longitudinally. Ovary rudimentary. Females: perianth tubular, 4-cleft. Ovary free, with a solitary ovule; style terminal, very short; stigma oblong, one-sided, or capitate, oblique. Fruit covered by the persistent perianth, chartaceous, longitudinally dehiscing into 2 valves. Testa membranous. Albumen none. Embryo straight, with plano-convex cotyledons, the radicle superior.—Scandent shrubs, with alternate, long-petioled, simple leaves. Stipules deciduous, axillary. Flowers in heads, arranged in cymes or cymose panicles and axillary, rarely the female heads solitary.

1. **C. suaveolens,** Bl.—An evergreen, large, scandent shrub, glabrous or the young shoots obsoletely rusty-pubescent; leaves oblong to ovate-oblong, rounded or obtuse or rarely cordate at the base, on a glabrous petiole 2-6 in. long, very shortly and bluntish acuminate, 6-8 in. long, entire, thick membranous, white-dotted above, beneath covered with adnate white streaks; flowers small, fragrant, sessile, in globular dense heads, the male heads yellow and forming a rather ample dichotomously branched cyme, the female ones purplish, larger and in shorter, more robust and simply dichotomous, poor cymes in the axils of the leaves or above the scars of the fallen ones, the peduncle and ramifications all glabrous, the former usually with 2 or 1 pair of large, opposite, brown deciduous bracts.

Hab.—Frequent in the tropical forests, especially along choungs, from Chittagong, Pegu Yomah, and Martaban down to Tenasserim.—Fl. Apr.-May; Fr. R.S.—s: l.—SS.=SiS. Metam., etc.

Remarks.—Wood brownish, porose, light.

ARTOCARPUS, L.

Flowers monoecious, the males and females crowded on separate globose or oblong receptacles. Males: perianth 2-3-4-parted, the segments free or more or less connate, imbricate in the bud. Stamen 1 only, exserted; filament complanate; anther 2-celled, dehiscing by a longitudinal slit. Females: perianth tubular, entire, the perianths of the surrounding flowers usually more or less connate. Ovary free, 1- very rarely 2- or 3-celled, the cells with a solitary pendulous ovule; style terminal or excentric, simple; stigma cylindrical, spatulate or peltate, or very rarely 2- or 3-cleft. Fruit a compound fleshy syncarp, consisting of the more or less enlarged, persistent and consolidated perianths, each enclosing a solitary pendulous seed with a chartaceous indehiscent pericarp. Albumen none. Cotyledons thick, the radicle superior.—Trees abounding in milky juice, with alternating, entire or lobed leaves. Stipules 2, axillary, large or small, deciduous. Syncarps variously shaped, usually from oblong to globular, solitary, peduncled, axillary, the male inflorescences catkin-like elongate.

* *Syncarps prickly-echinate.*

× The prickles of syncarp bristly-setose.

Leaves bristly scabrous above, softly pubescent beneath . . . *A. calophylla.*

Leaves glabrous above, slightly appressed-pubescent along the nerves beneath . . . . . *A. rigida.*

× × The prickles of syncarp smooth.

Leaves velvety-tomentose beneath, minutely pubescent above . *A. rufescens.*

* * *Syncarp tubercled, the tubercles usually scabrously setulose.*

Leaves, especially beneath, scabrous-pubescent; syncarp as large as the fist, globular, pendulous, on a slender peduncle . . *A. chaplasha.*

All parts quite glabrous; syncarp clavate to oblong, 1-1½ ft. long . *A. integrifolia.*

* * * *Syncarp smooth or nearly so, usually velvety or velvety-tomentose.*

All parts quite glabrous . . . . . *A. Gomeziana.*

Shoots densely rusty- or tawny-pubescent; leaves shortly scabrously pubescent . . . . . *A. Lakoocha.*

1. **A. calophylla,** Kz.—An evergreen middling-sized tree, the young shoots densely tawny-pubescent or almost tomentose and somewhat rough; leaves ovate to ovate-oblong, on a thick densely tawny-pubescent petiole ½-1 in. long, cordate or rounded at the base, acute, with a mucro, 4-6 in. long, rigidly coriaceous, entire or somewhat waved, above rough from short white bristles arising from minute tubercles, beneath softly pubescent; stipules lanceolate, tawny-pubescent; flowers unknown; fruits very similar to those of *A. rigida*, the size of the fist, globular, on a thick tawny-tomentose peduncle hardly ⅔ in. long, prickly echinate, the prickles nearly 3 lin. long, elongate-conical, bluntish, hispid; seeds oblong or ovoid, about ½ in. long.

Hab.—Upper Tenasserim.—Fr. Apr.

2. **A. rigida,** Bl. (*A. echinata*, Roxb.).—An evergreen tree (40—50+ (?) +3—4), the young shoots covered with scabrous yellowish bristly hairs; leaves obovate-oblong to oblong, acute or obtuse at the base, on a strong appressed-hispid petiole, bluntish or blunt, 5-9 in. long, entire or slightly waved, rigidly coriaceous, with the exception of the pubescent midrib glabrous and smooth above, beneath somewhat rough and appressed-hispid along the nerves; stipules yellowish pubescent, lanceolate; both the male and female inflorescences globular, on short appressed-hispid peduncles, the males axillary and the size of a gooseberry, the females somewhat longer-peduncled and terminal; syncarp globular, the size of a small shaddock, prickly echinate, the prickles about 2 lin. long, elongate-conical, bluntish, shortly scaly-hispid.

Hab.—Tenasserim.

Remarks.—Wood white, very light, soft, coarse-fibrous, takes very bad polish. Yields a sort of tenacious caoutchouk.

3. **A. rufescens,** Miq.—An evergreen middling-sized tree, the young shoots covered with a soft, velvety, rusty-coloured tomentum; leaves more or less oblong, on a strong rusty-velvety-tomentose petiole ½-1 in. long, rounded or almost cordate at the base, 6-9 in. long, acute or bluntish, while young obsoletely toothed, becoming entire, thick-chartaceous, minutely puberulous and glossy above, rusty-pubescent beneath; both the female and male inflorescences globular, axillary and solitary, on thick rusty- or tawny-velvety-tomentose peduncles 1-1½ in. long, the heads bracted at the base; syncarp globular, about 1-1½ in. in diameter, prickly echinate, the

prickles subulate, somewhat angular, about 2 lin. long or somewhat longer, smooth.

Hab.—Burma, probably Tenasserim.

4. **A. chaplasha,** Roxb.—*Toung-peing-nai.*—A tree (100—150 + 80—90 + 10—12), shedding leaves during H.S., the branchlets all rough and hirsute-pubescent; bark brown, rough from small fissures and large pustules, peeling off in large rounded flakes; cut brown, milky; leaves ample, obovate to obovate-oblong, on a very thick hispid-pubescent petiole only about ½ in. long, rounded or cordate at the base, acute, about a foot long, thick-chartaceous (those of the seedlings of a thin-chartaceous texture, pinnatifid, up to 2 ft. long), minutely sinuate-serrate or almost entire, above rough from minute bristles arising from pustules, shortly and roughish pubescent beneath; stipules lanceolate, pubescent; both, male and female, inflorescences almost globular, on roughish-velvety peduncles 1½-2 in. long and elongating, axillary and solitary, the flowers intermixed with small peltate scales; syncarps globular, as large as the fist, on a 2-4 in. long nodding peduncle, tubercled all over, the tubercles roundish, small, rough from brownish short bristles; seeds oblong, about ½ in. long.

Hab.—Common in the tropical forests from Chittagong and Martaban down to Tenasserim and the Andamans.—Fl. March-Apr.; Fr. Apr.-May.—s: l.—SS.=*Metam.* SiS., etc.

Remarks.—Wood yellowish white, turning pale brown, the heart-wood darker coloured, rather loose-grained, rather heavy, soon attacked by xylophages. □′=30 pd. Used for canoes and cart-wheels. Yields a tenacious milky caoutchouk.

5. **A. integrifolia,** Willd.; Bedd. Sylv. Madr., 219; Brand. For. Fl., 425.—*Peing-nai.*—An evergreen tree (40—60 + 10—25 + 6—7), all parts glabrous; leaves obovate-oblong to oblong, acuminate or acute at the base, on a rather slender glabrous petiole ½-1 in. long, apiculate or bluntish, 4-6 in. long, thick-chartaceous, entire, glabrous, glossy and dark-green above; stipules large, lanceolate, glabrous; inflorescences before their development enveloped in spathe-like bracts, afterwards naked, clavate-oblong, on rather slender glabrous peduncles ¾ to an in. long and finally thickening, arising singly or by pairs from the end of the branches or more usually from the end of short shoots springing from the main branches and trunk; syncarp very large, 1-2½ ft. long, weighing from 10-60 pounds, oblong, muricate-rough; seeds kidney-shaped, the size of a nutmeg, enveloped in a thin, white, smooth, chartaceous testa, lodged within the yellow-fleshy, and much-enlarged edible perianth-part.

Hab.—Cultivated all over Burma and the adjacent provinces and islands, but nowhere really wild, although often seen like wild along choungs and more especially in the vicinity of deserted habitations.—Fl. C.S.; Fr. R.S.—s.—SS.= ∞.

Remarks.—Wood yellow when fresh, changing into various shades of brown; the sap-wood small, coarse-fibrous and rather loose-grained, the heart wood close-grained, mottled, and takes a fine polish, like mahogany. □′=42 pd. Said to last 25-80 years. It is a very brittle wood, which does not bear great alternations of dry and wet, used to dye yellow clothes for poongyees. Also in use for building boats and for all kinds of furniture, building purposes, and carpentry. Used in England for cabinet-work, marquetry and turning, also for brush-backs. The best birdlime is prepared from the milky tenacious juice, which abundantly flows from recent wounds. The fruit generally known as jack-fruit; the seeds roasted considered not inferior to the best chestnuts.

6. **A. Gomeziana,** Wall.—An evergreen (?) middling-sized tree, all parts quite or nearly glabrous and somewhat pruinous; leaves oblong to ovate-oblong, rounded or obtuse at the base, on a glabrous petiole ½-1 in. long, shortly and abruptly acuminate, 6-10 in. long, entire, chartaceous, glabrous, glossy above, somewhat rough beneath, thinly and prominently net-veined between the strong lateral nerves; stipules lanceolate, sparingly appressed-pubescent; inflorescences naked, globular or irregularly globular, on shortly velvety-tomentose 3-4 lin. long peduncles arising singly from the axils of the leaves, the flowers intermixed with peltate scales; rest unknown.

Hab.—Tenasserim.—Fl. Nov.

7. **A. Lakoocha,** Roxb.; Bedd. Sylv. Madr., 219; Brand. For. Fl., 426.—*Myouk-loke.*—A tree (40—60+10—30+6—10), shedding leaves during H.S., the young shoots covered with a tawny or rusty, dense, villous tomentum; leaves oblong, rounded or almost cordate at the usually unequal base, shortly and usually abruptly acuminate or acute, on a strong tawny-pubescent or velvety, somewhat glabrescent petiole ¾-1½ in. long, rigidly thick-chartaceous, while young minutely sinuate-toothed and shortly and softly pubescent on both sides, adult minutely roughish puberulous above and very rough and shortly pubescent beneath (the leaves of the saplings of a thin texture, entire or more or less lobed), the net-veination between the lateral nerves strong and conspicuous; stipules lanceolate, densely tawny-pubescent; inflorescences of both sexes on very short pubescent peduncles, solitary in the axils of the leaves of the former year's shoots, the males irregularly oblong, yellow, the females a little longer peduncled, usually irregularly globular; syncarp of an irregular globular shape, the size of the fist or somewhat larger, smooth and velvety puberulous, when fully ripe yellow, edible; seeds oblong, lodged within the fleshy enlarged perianth-parts.

Hab.—Rather rare in the tropical forests of the Pegu and Martaban hills, especially along choungs; much cultivated in villages all over Burma.—Fl. March-Apr.; Fr. R.S.—s: l.—SS.=*SiS.* Metam.

Remarks.—Wood pale brown, light, rather coarse, with a dark ebony-like heart-wood.—□′=40 pd. Used for canoes. Roots used in dyeing yellow.

CUDRANIA, Tréc.

Flowers dioecious, packed into globular heads subtended by 2-4 bracts which alternate with the perianth-lobes. Males: perianth 4-parted, the segments imbricate in the bud. Stamens 4, opposite the perianth-segments and sometimes adhering to their base. Females: perianth as in the males, persistent. Ovary free, with a single pendulous ovule; style simple, with a rudimentary tooth-like branch at the base; stigma filiform, puberulous. Fruit a syncarp, composed of the fleshy, enlarged, velvety, free, or more or less connate perianths within which the crustaceous nuts are lodged. Testa very thin. Embryo in the axil of the albumen; cotyledons rather thick, folded, the radicle very long, superior.—Scandent spiny shrubs, with entire leaves. Stipules axillary, connate. Flower-heads peduncled, by pairs in the axils of the leaves.

× Leaves 1½-3 in. long, glabrous.
Young branches pubescent; leaves blunt or bluntish, the nerves thin but prominent . . . . . *C. Amboinensis.*
× × Leaves 4-6 in. long, abruptly acuminate, the nerves strongly prominent.
All parts quite glabrous . . . . . *C. fruticosa.*
Leaves, especially beneath, pubescent . . . . . *C. pubescens.*

1. **C. Amboinensis,** Rumph. (*Cudranus Rumphii,* Thw.; Bedd. Sylv. Madr., 20, t. 27, f. 1).—A very large straggling or scandent dioecious shrub, often growing out into a small tree with very long drooping branches, armed with long sharp somewhat recurved spines, the young branchlets tawny-pubescent; leaves obovate to obovate-lanceolate, on a thin 2-3 lin. long petiole, entire, blunt or rounded to shortly acuminate and mucronate, 1½-3 in. long, acute to bluntish at the base, thin-chartaceous, glabrous; flower-heads globular, pubescent, the size of a pea or smaller, the females on rather thick densely puberulous peduncles 2-3 lin. long, the males on longer slender ones, by pairs in the axils of the leaves; syncarp globular, the size of a very small cherry, the perianths all fleshy and connate, glaucous-green and velvety; seeds several, imbedded in the fleshy perianths.

Hab.—Chittagong.

3. **C. fruticosa,** Wight.—A large dioecious scandent shrub, armed with curved sharp spines, all parts quite glabrous; leaves elliptically oblong to oblong, on a slender glabrous petiole 4-5 lin. long, rounded at the base, rather abruptly and thinly acuminate, 4-6 in. long, membranous, quite glabrous, the lateral nerves strong and prominent, approximate towards the base, the net-veination lax and prominent; flower-heads globular, the size of a pea, puberulous, the females on rather thick 2-4 lin. long puberulous pedur-

cles, arising by pairs from the axils of the leaves; syncarp irregularly globular, the size of a cherry, velvety and glaucous-green; seeds as large as a small pea, ovoid, enveloped in the broad enlarged perianths and protruding from the fleshy centre.

HAB.—Ava; Chittagong; Upper Tenasserim.—Fl. Oct.-Nov.; Fr. Feb.-Apr.

3. **C. pubescens,** Tréc.—*Doung-kyet-tek.*—An evergreen, large, woody climber, armed with long, straight, sharp spines, the young branchlets pubescent, the stem terete, greenish grey, lenticellate; cut milky; leaves ovate to ovate-oblong, on a slender puberulous petiole about ½ in. long, rounded at the base, 4-6 in. long, abruptly and rather long and thinly acuminate with a mucro, entire, membranous, above slightly, beneath softly, but shortly pubescent, the lateral nerves prominent; flower-heads globular, on slender puberulous peduncles ½ an in. long, arising by pairs from the axils of the leaves; styles simple, flexuose; syncarps irregularly globular, the size of a large cherry, fleshy and compact, velvety and wrinkled, glaucous-green; seeds several, imbedded in the fleshy connate perianths.

HAB.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and Martaban, up to 3,000 ft. elevation.—Fr. March-Apr.—s: l.—SS.=Metam. SiS.

REMARKS.—Wood white.

FICUS, L.

Flowers monoecious, covering the inner side of the receptacles of a globular to pear-shaped outline. Perianth 3-5-phyllous, rarely none, the segments various, united in a tube or sessile, or sometimes quite free and somewhat remote from the reproductive organs. Males: stamens 1 to 6, opposite the perianth-segments; anthers 2-celled. Ovary-rudiment none. Females: ovary sessile or on a shorter or longer stalk, 1- very rarely 2-celled, with a solitary ovule; style short or elongate, more or less lateral, with a simple, linear or unequally 2-cleft or funnel-shaped stigma, rarely the stigmas of all the flowers united in a disk. Achenes minute, somewhat crustaceous, enclosed or surrounded by the perianth, if present. Embryo in the centre of the fleshy or thin albumen.—Trees or shrubs, often scandent or epiphytical and stem-clasping, with alternate, rarely opposite, simple or lobed leaves. Stipules lateral, free, more or less deciduous. Receptacles (figs) from the size of a small pea to that of an apple, sessile or peduncled, contracted in a stalk or not, inside naked or rarely rigidly pilose between the flowers, usually by pairs or by abortion solitary in

the axils of the leaves, or arising from the trunk or from radical leafless shoots.

A.—Receptacles by pairs, or solitary from the axils of the leaves or from above the scars of the fallen ones (never from the stem or root-shoots).

* *Leaves more or less thick-coriaceous to almost chartaceous, glabrous or rarely puberulous or floccose-villous beneath. Receptacles various, usually smooth, rarely villous or pubescent, not hispid or hairy within, the mouth closed by 3 or 4 blunt closely-appressed bracts. Male flowers monandrous. Stigma filiform-elongate, very rarely 2-cleft.—Trees or arboreous stem-clasping climbers.*

○ Petioles usually thick and short, rarely slender, not jointed and thickened at the insertion of the blade.

‡ Leaves more or less firmly coriaceous, 4-10 in. long, rarely shorter, the petiole strong and thick, and usually short in comparison with the blade; receptacles sessile, the size of a large or small cherry.

× Leaves 3-5-plinerved, shortly pubescent or, while young, floccose-villous beneath or on both sides; receptacles puberulous, floccose or tomentose, more or less glabrescent.

Leaves shortly pubescent beneath, blunt or apiculate; young shoots and stipules puberulous . . . . . *F. Bengalensis.*

Leaves glabrous, shortly acuminate; young receptacles floccose; stipules rusty or tawny villous-pubescent . . . . . *F. Mysurensis.*

Leaves and receptacles while young covered with a floccose rusty-coloured dawn; stipules rusty or tawny villous-pubescent . *F. pilosa.*

× × Leaves quite glabrous.

Branchlets roughish from rusty-coloured asperities; leaves penninerved, shortly acuminate; bracts deciduous . . . *F. onusta.*

Glabrous; leaves triplinerved, blunt or blunt apiculate; bracts glabrous, persistent . . . . . *F. laccifera.*

As former, but young shoots, stipules and bracts puberulous, the latter falling off already in bud . . . . . *F. altissima.*

Glabrous; leaves triplinerved, acuminate, in a dried state brownish beneath; bracts glabrous, persistent . . . . . *F. Indica.*

Glabrous; leaves very thick-coriaceous, rounded or obtuse at base, the lateral nerves very thin and inconspicuous; petiole short . *F. obtusifolia.*

‡ ‡ Leaves as in former, but receptacles on a shorter or longer peduncle, the size of a cherry to that of a plum.

Glabrous; leaves penninerved, pale-coloured beneath; peduncles very short and thick, villous-pubescent . . . . . *F. annulata.*

Glabrous; leaves penninerved, acuminate; peduncles 3-5 lin. long, glabrous . . . . . *F. Thomsoni.*

‡ ‡ ‡ Leaves large, coriaceous, the lateral nerves all thin and parallel-running, very closely set.

Glabrous; petiole short and thick; stipules up to 6 in. long, red . *F. elastica.*

‡ ‡ ‡ ‡ Leaves rather small, 2-3 in. long, rarely longer, thin-coriaceous to almost chartaceous, the nerves thin, more or less crowded and parallel-running, with a more or less distinct transverse veination or net-veination between.

× Receptacles sessile or shortly peduncled, the size and shape of a pea or smaller. All parts glabrous.

Leaves more or less narrowed at base, coriaceous, blunt to blunt-apiculate . . . . . *F. retusa.*
Leaves chartaceous, long but bluntish acuminate, the nerves and net-veination prominent on both sides; receptacles very shortly peduncled, the size of a pepper-kernel . . . . . *F. affinis.*
As former, but receptacles sessile, as large as a pea . . . *F. rhododendrifolia.*

× × Receptacles the size of a cherry or plum. All parts glabrous.

Receptacles contracted in a slender stalk; nerves inconspicuous, almost immersed and rather distant . . . . . *F. muda.*
Receptacles sessile or slightly tapering in a very thick base; nerves crowded and along with the transverse veination strongly prominent on both sides . . . . . *F. benjamina.*

○ ○ Petioles longer or shorter, slender, jointed and thickened at the insertion of the blade; leaves chartaceous to thin-coriaceous.

× Receptacle sessile or nearly so, the size and shape of a pea; leaves elliptical or nearly so.

† Receptacles glabrous.

Leaves almost chartaceous, penninerved, the nerves and veination prominent on both sides; petiole 1-2 in. long . . . *F. infectoria.*
Leaves coriaceous and often rigid, penninerved, the nerves rather obsolete, the petiole as long or longer than the blade . . *F. geniculata.*

†† Receptacles villous-tomentose.

A tree, in foliage quite resembling the former . . . . *F. insignis.*

× × Receptacles usually the size of a small cherry, glabrous; leaves cordate or nearly so, the petiole very long and slender.

Leaves opaque, white-dotted on the upper side, rather short acuminate, undulate . . . . . *F. Rumphii.*
As former, but the leaves not white-dotted, repand-toothed and the nerves crowded, conspicuous and almost rectangularly diverging . . . . . *F. caloneura.*
Leaves very glossy, not white-dotted, undulate, abruptly and very long caudate-acuminate . . . . . *F. religiosa.*

∗ ∗ *Leaves membranous to chartaceous, rarely rigidly coriaceous; glabrous or usually more or less hairy. Receptacles various, sessile or peduncled, often narrowed or constricted in a stalk, the mouth usually furnished with more than 3 scales, variously arranged and somewhat spreading or erect (never closely appressed), so as to shew also the inner scales. Male flowers with 2 to 6 (rarely 1) stamens. Stigma various, usually funnel-shaped, laterally produced in one or two short lobes, rarely simple.*

△ Receptacles not stalked and not tapering at base.

† Receptacles globular to turbinate, sessile, more or less appressed-hispid or pubescent.

Tawny- or brown-hispid; leaves at base 5-7-nerved, usually lobed; bracts of receptacles 3-4 lin. long . . . . . *F. triloba.*
Tawny- or greyish-hispid; leaves at base usually 3-nerved, often lobed; bracts of receptacles only about a line long . . *F. hirta.*
Tawny- or brown-tomentose and pubescent; leaves simple, at base 3-nerved, almost entire . . . . . *F. chrysocarpa.*

†† Receptacles globular to turbinate, peduncled, the peduncle usually short, sometimes very short. Young shoots pubescent, adult leaves more or less glabrescent.

× Receptacles the size of a cherry, pubescent.

Leaves glabrous; petioles ¼-½ in. long; peduncle usually less than a line long . . . . . *F. pubigera.*

Leaves slightly pubescent beneath; petioles 1-1½ in. long; peduncles 2-3 lin. long . . . . . *F. lepidosa.*

× × Receptacle the size of a pea, glabrous.

Leaves thin-membranous, glabrous, or pubescent on the nerves beneath . . . . . *F. Lamponga.*

△ △ Receptacles stipitate, *i. e.*, at base contracted or tapering in a longer or shorter stalk.

† Stipitate receptacles sessile or nearly so; leaves glabrous or nearly so.

× Leaves rigidly but thin coriaceous, yellow and brown variegated beneath.

Receptacles glabrous or somewhat scabrous; leaves acute or apiculate . . . . . *F. excelsa.*

× × Leaves thin but rigidly chartaceous, prominently net-veined on both sides.

Receptacles hispid-scabrous; leaves long-caudate-acuminate . . *F. radicans.*

× × × Leaves thick-membranous, the net-veination not prominent, at least not above, long-acuminate.

Leaves entire; receptacles usually with a few scales on their circumference; stalk of receptacle scaled . . . . . *F. subulata.*

Leaves crenate-serrate towards the apex; receptacles and their stalk not scaled . . . . . *F. uniglandulosa.*

† † Stalked receptacles longer or shorter peduncled.

× Glabrous or almost glabrous trees. Receptacles abruptly stalked; leaves not tessellate-net-veined beneath.

§ Receptacles the size of a pea or thereabouts, smooth; petiole ¼-½ in. long.

Leaves rigidly chartaceous, blunt-acuminate, vividly green . . *F. vasculosa.*

Leaves thin but rigidly chartaceous, sharply acuminate, brownish beneath . . . . . *F. nervosa.*

§ § Receptacles the size of a prune, along with the long peduncle scabrous-puberulous.

Leaves large, glaucous-green, more or less rounded at apex; petiole 1-2 in. long . . . . . *F. callosa.*

× × Glabrous or almost glabrous, often rooting climbers. Receptacles abruptly and shortly peduncled; leaves rigidly coriaceous, usually tessellate-net-veined beneath.

§ Leaves not tessellate-net-veined beneath; receptacles the size of a pea to that of a small cherry, the flowers mixed with bristles.

Receptacles quite smooth . . . . . *F. ramentacea.*

§ § Leaves tessellate-net-veined beneath; flowers not mixed with bristles.

‖ Receptacles large, the size of a pigeon's or hen's egg.

Glabrous; leaves blunt; receptacles smooth, apple-shaped . . *F. pomifera.*

‖ ‖ Receptacles the size of a pea or larger.

Receptacles scabrous . . . . . *F. scandens.*

× × × Roughly puberulous low shrubs, creeping or ascending; receptacles more or less abruptly stalked.

Leaves serrate; receptacles the size of a cherry, white-tubercled . *F. scabrella.*

Leaves coarsely sinuate and almost lobed; receptacles the size of a pepper-kernel, scabrous pubescent . . . . . *F. anastomozans.*

× × × × Glabrous or pubescent erect or creeping shrubs. Receptacles gradually narrowed in a stalk and therefore pear-shaped; peduncle usually long and conspicuous.

§ Creeping low shrub. Leaves serrate.

Leaves variously shaped from cordate and palmately lobed to cordate-lanceolate and undivided, scabrous-pubescent, especially beneath . . . . . *F. heterophylla.*

§ § Erect shrubs. Leaves entire, more or less lanceolate to linear-lanceolate.

Leaves and receptacles glabrous . . . . . *F. ischnopoda.*

Leaves greyish pubescent beneath; receptacles and peduncles pubescent . . . . . *F. subpyriformis.*

B.—Receptacles arising in clusters or by pairs in racemes or spikes from tubercle-like or reduced leafless racemose branchlets or from bracted shoots from the roots or stems (in a few species arising at the same time from the axils of the leaves), more or less depressed-pyriform to pyriform and turbinate, often more or less scaled on their circumference; mouth strongly umbilicate by numerous more or less erect bracts; male flowers often monandrous. Stigma usually thickened and papillose.

\+ Leaves glabrous or pubescent beneath, entire.

† Leaves more or less oblong-lanceolate, penni-nerved; receptacles the size of a pea or thereabouts, scaly.—Trees.

Receptacle obsoletely ribbed, glabrous, long-peduncled . . *F. Ribes.*

†† Leaves lanceolate to linear, penninerved. Receptacles the size of a cherry or larger.—Shrubs.

Receptacles ribbed, along with the peduncle rusty-hirsute; leaves thinly scabrous-pubescent beneath . . . . . *F. pyrrhocarpa.*

Glabrous; receptacles ribbed, smooth, pustulate . . . . *F. lanceolata.*

††† Leaves more or less broadly oblong to oblong-lanceolate, 3-nerved at base. Receptacles the size of a prune to that of an apple.—Trees.

Receptacles on long glabrous peduncles; young shoots glabrous . *F. glomerata.*

Receptacles on very short pubescent peduncles; young shoots pubescent . . . . . *F. Chittagonga.*

†††† As former, but leaves penninerved, glabrous.

Leaves thick-membranous, acute at base; receptacles long-peduncled, usually roughish brown . . . . . *F. fistulosa.*

Leaves thin chartaceous, rounded at the somewhat narrowed base; receptacles long-peduncled, smooth . . . . . *F. macropoda.*

\+ + Leaves pubescent beneath only or glabrous, more or less crenate-serrate, more or less rounded or cordate at base.

† Leaves glabrous, 3-5-nerved at base; receptacles very large.

Receptacles long-peduncled, glabrous, not ribbed . . . *F. pedunculata.*
Receptacles shortly and densely pubescent, indistinctly ribbed . *F. regia.*

†† Leaves pubescent beneath, 3-5-nerved at base; receptacles very large.

Peduncles and receptacles densely hispid-tomentose . . . *F. Roxburghii.*

+++ Leaves on both sides more or less roughish pubescent, serrate. Receptacles usually more scaly round their circumference.

† Leaves not oblique; receptacles arising from radical shoots and at the same time from the axils of the leaves, pyriform. Bark grey.

Leaves usually opposite; receptacles and peduncles greyish pubescent . . . . . *F. hispida.*

†† Leaves oblique, base on one side produced in a large half-cordate lobe, receptacles scaly, roughish pubescent. Bark red-brown.

Receptacles on longer or shorter peduncles, more or less pyriform . *F. cunia.*
Receptacles sessile or nearly so, more or less turbinate . . *F. conglomerata.*

* *Receptacles by pairs or singly from the axils of the leaves (never from the trunk or from root-shoots).*

× Receptacles various, the mouth closed by 3 or 4 blunt closely-appressed bracts. Male flowers monandrous. Stigma filiform-elongate (or rarely 2-cleft).

1. **F. Bengalensis,** L.; Bedd. Sylv. Madr., 222; Brand. For. Fl., 412.—*Pyee-nyoung.*—A tree (50—70+10—20+8—12), sending down numerous aëral roots from the branches which grow out into as many stems up to 3 or 4 or more feet girth, shedding leaves in H.S., all softer parts covered with a short soft pubescence; stipules appressed silvery-pubescent; leaves ovate to ovoid-oblong, on a strong puberulous petiole 1-2 in. long, rounded or obtuse at the base, blunt or shortly and bluntish apiculate, 5-8 in. long, entire, coriaceous, minutely and softly pubescent, glabrescent above, shortly above the base 3-nerved, the veination prominent and the net-veination rather close; receptacles globular, the size of a small cherry, sessile, by pairs in the axils of the leaves, puberulous, crimson, 3- bracted at the base; bracts broad and large, roundish, almost glabrous.

Hab.—Rarely cultivated in Pegu, more so in Chittagong.—Fr. H.S.

Remarks.—Wood white, very soft, porous, coarsely fibrous, very light and perishable.

2. **F. Mysurensis,** Roth.; Bedd. Sylv. Madr., 222.—An evergreen tree (50—60+10—25+4—5), the young parts covered with fugaceous rusty or tawny-coloured wool; stipules tawny-villous; leaves obovate-oblong to obovate-lanceolate, on a strong glabrescent petiole ½-1½ in. long, rounded or obtuse at the somewhat narrowed base, 5-9 in. long, shortly and often somewhat abruptly acuminate, entire or slightly repand, coriaceous, glabrous above,

beneath covered with a very fugaceous tawny or greyish wool, also in a dried state remaining green or yellowish green, 3- or often remotely 5-7-nerved above the base, the lateral nerves numerous, parallel, the net-veination lax and conspicuous; receptacles by pairs in the axils of the leaves, sessile, globular, the size of a small cherry, bright red, while young covered with a fugaceous woolly tomentum, glabrescent; bracts small.

Hab.—In the Eng and low forests of Martaban, east of Tounghoo; Ava.—Fr. Apr.—l.—SS.=Lat. Dil.

3. **F. pilosa,** Rwdt.—An evergreen large tree with a large spreading crown, all younger parts covered with a villous-woolly, fugaceous, rusty or golden-coloured tomentum; stipules tawny or golden villous; leaves from obovate-oblong and elliptically oblong to almost oblong, on a woolly glabrescent strong petiole 1-1½ in. long, rounded or obtuse at the base, 4-10 in. long, bluntish apiculate, entire or slightly waved, coriaceous, beneath while young covered with a dense, fugaceous, tawny or golden woolly tomentum, when full-grown glabrous, regularly turning brown in drying, strongly 3-nerved at the base, and often with 2 additional thinner nerves, the lateral nerves rather irregular, strong, and anastomosing towards the margin, the lax net-veination conspicuous; receptacles sessile, by pairs in the axils of the leaves, depressed-globular, the size of a small or large cherry, bright red, while young clothed with a woolly tomentum, soon becoming quite glabrous, 3-bracted at the base, the bracts rather large, broad and rounded, almost glabrous.

Hab.—Upper Tenasserim.—Fr. Feb.

4. **F. onusta,** Wall.—A tree, all parts glabrous; leaves elliptical to elliptically lanceolate, rounded or almost acute at the base, on a strong but rather slender petiole 1-1½ in. long, shortly acuminate, 5-9 in. long, entire, coriaceous, glabrous, in drying turning brown or reddish brown beneath, hardly 3-nerved, but with 2 short diverging nerves above the base, the lateral nerves thin but strong, anastomosing towards the margin, the lax net-veination thin but conspicuous; receptacles by pairs in the axils of the leaves, on very short and thick glabrous peduncles, globular or nearly so, umbonate, the size of a small cherry, smooth, orange-coloured, 3-bracted at the base, the bracts continuous (not covered by a dilated peduncle-apex), ovate, rather blunt, free, only about ½ lin. long, glabrous.

Hab.—Tenasserim.

5. **F. laccifera,** Roxb.; Bedd. Sylv. Madr., 223; Brand. For. Fl., 418.—*Nyoung-pen.*—A tree (80—100+40—60+6—15), shedding leaves in H.S., of very various habit, either a simple-stemmed tree

with aëral roots, or sending out numerous aëral trunks as thick as a man's body or thicker, and forming a labyrinth like *F. Bengalensis*, all parts glabrous; bark grey, covered with pustules; cut milky; stipules glabrous; leaves oblong to almost ovate-oblong, on a thick 1-2 in. long petiole, sometimes somewhat unequal at the rounded or obtuse base, 4-6 in. long, bluntish or shortly and bluntish apiculate, entire, coriaceous, glabrous, 3-nerved above the base, usually with 2 thin inconspicuous additional nerves, the lateral nerves few, thin, somewhat curved and remote, anastomosing, the lax net-veination thin and somewhat obsolete; receptacles sessile, by pairs in the axils of the leaves, globular, the size of a cherry, glabrous, orange-red or yellow with lighter dots, supported only by the annular base of the very deciduous glabrous bracts.

Hab.—Frequent in the tropical forests of the eastern and southern slopes of the Pegu Yomah and the Martaban hills down to Tenasserim and the Andamans. —Fr. Mar.-Apr.—s: l.—SS.=SiS. Metam., etc.

Remarks.—Wood white, coarse and soft, perishable. Yields a very good sort of caoutchouk equal to that of *F. elastica*.

6. **F. altissima,** Bl.—An evergreen (?) very large tree, all parts glabrous, except the softly greyish pubescent stipules; leaves oblong to ovate-oblong, obtuse or rounded at the base, on a strong petiole 1-1½ in. long, blunt or bluntish apiculate, 3-6 in. long, entire, coriaceous, glabrous, 3-nerved above the base and usually with 1 or 2 thin additional nerves along the margin, the lateral nerves strong, but little prominent, anastomosing towards the margin, the veination tolerably lax; receptacles sessile, by pairs in the axils of the leaves, oblong or nearly so, the size of a cherry, glabrous, supported only by the circular pubescent base of the very caducous pubescent bracts.

Hab.—Upper Tenasserim.—Fr. March-Apr.

7. **F. Indica,** L.—An evergreen large tree, usually stem-clasping or erect, with a divaricate crown, all parts glabrous; stipules glabrous; leaves from oblong and elliptical to obovate-oblong, obtuse or acute at the base, on a strong petiole up to an inch long, shortly and rather abruptly acuminate or apiculate, 5-7 in. long or longer, entire, coriaceous, glabrous, 3-plinerved, the lateral nerves numerous, thin, parallel, anastomosing towards the border, the very lax net-veination conspicuous; receptacles sessile, by pairs in the axils of the leaves or more usually from above the scars of the fallen ones, globular or nearly so, the size of a very small cherry, glabrous, 3-bracted, the bracts persistent, large, broadly ovate, blunt, puberulous or glabrous.

Hab.—Rather rare in the tropical and moister upper mixed forests of the Pegu Yomah, more frequent in those from Martaban down to Tenasserim.—Fr. Jan.-Feb.—s.—SS.=SiS. Metam., etc.

8. **F. obtusifolia,** Roxb.—*Nyoung-kyap.*—An evergreen tree (50—70 + 15—40 + 6—12), stem-clasping or independent, all parts glabrous; bark grey, about a line thick, rather smooth, with corky pustules; cut reddish, milky; stipules linear-lanceolate, glabrous; leaves from oblong and elliptical to obovate-oblong, often somewhat unequal at the acute or obtuse base, on a short thick petiole 6-8 lin. long, rounded, blunt or apiculate, entire, 4-10 in. long, thick-coriaceous, glabrous, thinly 3-nerved at the base, the lateral nerves all thin, anastomosing near the margin, the veination thin and lax; receptacles sessile, by pairs in the axils of the leaves or from above the scars of the fallen ones, somewhat triangular-globular, the size of a small cherry, glabrous, sprinkled with minute pale-coloured pustules, yellowish, bracted, the bracts persistent, large, roundish cordate, blunt, smooth.

Hab.—Frequent in the tropical forests from Chittagong and Ava down to Tenasserim.—Fr. Nov.-Apr.—s × l.—SS.=SiS. Metam., etc.

Remarks.—Wood white, coarsely fibrous. Exudes a rather good quality of caoutchouk.

9. **F. annulata,** Bl.—An evergreen tree (60—70 + 12—30 + 8—12), stem-clasping, with an irregular trunk often quite netted-diffuse, all parts glabrous; bark whitish grey, smooth, sprinkled with brown pustules and short fissures, ⅓ in. thick; cut brown, milky; stipules glabrous; leaves lanceolate to oblong- and elliptically lanceolate, acuminate at both ends or acute at the base, on a rather strong petiole 1-1½ in. long, 9-6 in. long, coriaceous, glabrous, in drying becoming more or less greyish brown and opaque beneath, only with 2 thin nerves above the base, the lateral nerves rather remote and parallel, thin but prominent, the net-veination thin and lax; receptacles on short, thick, shortly pubescent or almost glabrous peduncles arising by pairs from the axils of the leaves, ovoid to oblong, nearly an inch long, umbonate, glabrous, yellowish orange, 3-bracted at the base, the bracts free, ovate, acute, pubescent or glabrous, nearly 2 lin. long, the peduncle annular, thickened under the bracts.

Hab.—Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim.—Fr. Oct.-March.—s.—SS.=SiS. Metam., etc.

Remarks.—Wood yellowish, turning pale brown, rather heavy, soft and perishable. Yields a rather good quality of caoutchouk.

10. **F. Thomsoni,** Miq.—A tree, all parts glabrous; stipules linear-subulate, glabrous; leaves lanceolate to oblong-lanceolate, acute or obtuse at the base, on ½-1 in. long petiole, bluntish acuminate, 5-7 in. long, chartaceous, when full-grown coriaceous, entire, glabrous, 3-plinerved, the lateral nerves rather remote-

diverging, somewhat arcuate, uniting towards the margin, the net-veination lax and thin; receptacles on slender 3-5 lin. long peduncles marked at their end with the scars of the fallen very deciduous bracts, usually by pairs in the axils of the leaves, obovate-globular, not or indistinctly stalked, the size of a large pea or larger, orange-coloured, smooth; bracts not seen.

Hab.—Upper Tenasserim.—Fr. March.

11. **F. elastica,** Bl.; Brand. For. Fl., 417.—An evergreen tree (50—60+20—30+5—10), all parts glabrous; stipules very large and conspicuous, red, lanceolate, smooth; leaves oblong to elliptical, rounded or obtuse at the base, 5-8 in. long, on a strong petiole ½-1½ in. long, shortly and bluntish acuminate or apiculate, entire, coriaceous, glabrous, the nerves all very crowded and thin, regularly parallel, uniting near the margin; receptacles sessile on the cup-like base of the fallen bracts, usually by pairs in the axils of the leaves, oblong, the size of an olive, smooth, greenish yellow; bracts very deciduous, glabrous, leaving a short almost entire cup under the ripe receptacle.

Hab.—Frequent in Upper Burma, where whole forests of this species are said to exist in the valley of Hookhoom.

Remarks.—Yields the Indian caoutchouk of commerce.

12. **F. retusa,** L.; Bedd. Sylv. Madr., 223; Brand. For. Fl., 417.—*Nyoung-op.*—An evergreen tree (50—60+12—30+6—12), often stem-clasping, all parts glabrous; leaves variable in size and shape, oblong to obovate and obovate-oblong, obtuse at the base, on a short petiole up to ½ in. long, blunt or bluntish apiculate, 2-5 in. long, entire, coriaceous, glabrous, 3-plinerved, the lateral nerves thin and tolerably parallel, anastomosing towards the margin, the parallel net-veination thin; receptacles sessile, by pairs or solitary in the axils of the leaves or above the scars of the fallen ones, globular, the size of a pea, greenish yellow, glabrous, 3-bracted, the bracts persistent, ovate, concave, glabrous.

Var. 2, **macrocarpa:** leaves larger, almost 5-plinerved at the base, the nerves stronger; receptacles twice the size of those in the normal form, orange-coloured, the bracts much smaller.

Hab.—Frequent, more especially in the tropical forests along choungs, but also in all other kinds of forests, even in the tidal ones, all over Burma and the adjacent provinces down to Tenasserim and the Andamans; var. 2: in the tropical forests of the eastern slopes of the Pegu Yomah and in Martaban.—Fr. ∞.—s.×l.—SS.=∞, *Metam.*

13. **F. affinis,** Wall.—An evergreen tree (40—50+10—15+4—6), with a dense large crown, all parts glabrous; stipules short and small, ovate-lanceolate, glabrous; leaves elliptical to ovate-oblong, obtuse or rounded at the base, bluntish and rather abruptly

acuminate, on a slender petiole ½-¾ in. long, 3-4 in. long, chartaceous, entire or somewhat waved, glabrous, sometimes obscurely 3-nerved at the base, the lateral nerves numerous and tolerably parallel, uniting towards the margin, the net-veination copious, prominent and conspicuous on both sides; receptacles on very short (½-1 lin. long) peduncles, arising usually in pairs from the axils of the leaves or above the scars of the fallen ones, globular, the size of a pepper-kernel or somewhat larger, yellowish, with orange obsolete pustules, glabrous, 3-bracted at the base, the bracts persistent, minute, broadly 3-angular.

Hab.—Not unfrequent in the tropical forests of the Pegu Yomah along choungs; also in similar localities on the Andamans and probably also Tenasserim.—Fr. Jan.-March.—s.—SS.=SiS.

14. **F. rhododendrifolia,** Miq.—An evergreen tree (40—50 + 10—12 + 4—5), all parts glabrous; stipules linear-lanceolate, slightly appressed-pubescent; leaves oblong and elongate to elliptically oblong, rather acute at the base, on a slender ½-¾ in. long petiole, rather abruptly and almost caudate-acuminate, 3-5 in. long, thin-coriaceous, entire, glabrous, penninerved, the lateral nerves thin and rather regularly parallel, uniting towards the margin, the net-veination rather lax, but copious and prominent on both sides; receptacles sessile, by pairs in the axils of the leaves, globular, the size of a large pea, slightly umbonate, red, glabrous, 3-bracted at the base, the bracts broad and rounded, short, glabrous, persistent.

Hab.—Tropical forests of the Pegu Yomah; also Andamans.—Fr. C.S. and H.S.—s.—SS.=SiS.

15. **F. euphylla,** Kz.—An evergreen tree, all parts glabrous, the branchlets whitish; stipules lanceolate, acuminate, almost glabrous; leaves ovate to elliptical and elliptically oblong, rather acute at the contracted base, on a strong petiole ½-1 in. long, shortly but rather abruptly acuminate, 4-5 in. long, coriaceous, entire, glabrous and glossy, beneath pale-coloured, the midrib broad and prominent, especially on the upper side, the lateral nerves thin and rather parallel, narrow-set, uniting towards the margin, the net-veination rather lax and little prominent; receptacles sessile, by pairs in the axils of the leaves, globular, the size of a large pea, glabrous, 3-bracted at the base, the bracts small, broadly ovate, acute, glabrous.

Hab.—Ava, Kakhyen hills.—Fr. March.

16. **F. nuda,** Miq.—An evergreen tree (40—50 + 10—12 + 5—6), all parts glabrous; stipules small, lanceolate, glabrous; leaves ovate-oblong to oblong, acute at the base, on a 4-6 lin. long petiole, bluntish acuminate, 3-4 in. long, chartaceous, entire, glabrous, faintly 3-nerved at the base, the midrib broad and prominent

on the upper side, the lateral nerves rather crowded, parallel, thin, and uniting near the margin, the net-veination parallel; receptacles abruptly narrowed in a longer or shorter stalk, usually by pairs in the axils of the leaves, globular or nearly so, the size of a large pea to that of a cherry, glabrous, blood-red when fully ripe; bracts very deciduous, only present in the bud.

Var. 1, **nuda proper**: receptacles the size of a large pea, on a very short stalk or almost sessile.

Var. 2, **macrocarpa**: receptacles the size of a cherry, narrowed in a stalk 2-3 lin. long.

Hab.—Var. 2: in the tropical forests of the eastern slopes of the Pegu Yomah along choungs; also in Tenasserim.—s.—SS.=SiS.

17. **F. benjamina**, L.; Bedd. Sylv. Madr. 222.—An evergreen tree (50—60+12—20+6—8), with a dense divaricate crown and pendulous branches, all parts glabrous; stipules small, lanceolate, glabrous; leaves ovate to elliptically ovate, on a slender petiole 5-8 lin. long, obtuse at the base, rather long and bluntish acuminate, 2-3½ in. long, rigidly chartaceous, entire, glabrous, the nerves thin, much crowded and uniting near the margin, all parallel with a transverse net-veination between, prominent on both sides; receptacles sessile, by pairs or solitary in the axils of the leaves, globular or almost obovate and narrowed at the base, varying in size from ⅓ to nearly ¾ in. in diameter, blood-red when fully ripe, glabrous, 3-bracted, the bracts broad, but short, rounded, glabrous.

Var. 1, **benjamina proper**: receptacles globular, about ⅓ in. across.

Var. 2, **comosa** (*F. comosa*, Roxb.; Bedd. Sylv. Madr., 223): receptacles ½ to nearly ¾ in. thick, narrowed at the base.

Hab.—Var. 1: in the tropical forests of the Andamans; var. 2: not unfrequent in similar forests, especially along choungs, from Ava and Martaban down to Tenasserim.—Fr. Nov.-Apr.—s.×l.—SS.=SiS. Metam., etc.

18. **F. infectoria**, Willd.; Bedd. Sylv. Madr., 222; Brand. For. Fl., 414.—*Nyoung-chin.*—A leaf-shedding (?) tree (50—6+015—20+5—9), with a large dense crown, all parts glabrous, the branchlets comparatively slender; stipules short, ovate, acute, minutely and fugaceously appressed-puberulous; leaves oblong and elliptical to ovate-oblong, often a little unequal at the acute or rounded base, 5-7 in. long, acuminate, entire or waved, on a 1½-2 in. long petiole jointed at the apex, chartaceous, glabrous (in a dried state not or little glossy), shortly and thinly 3-nerved at the base, the nerves all prominent on both sides, rather distant and arcuately uniting towards the margin, the net-veination copious and conspicuous on both sides; receptacles sessile or nearly so,

usually by pairs in the axils of the leaves or above the scars of the fallen ones, globular, the size of a very large pea, umbonate, yellow, whitish pustulate, 3- or 4-bracted at the base, the bracts persistent, ovate, acute, minutely pubescent.

HAB.—In the upper mixed forests of Martaban, east of Tounghoo, up to about 2,000 ft. elevation.—l.—SS.=Metam.

19. **F. geniculata,** Kz.—*Nyoung-tha-bye.*—A tree (30—60 + 20—40 + 3—6), leafless in H.S., stem-clasping, with robust scared branchlets pubescent at their softer extremities; stipules broadly ovate, acute, glabrous or canescent; leaves elliptical to elliptically ovate and ovate-oblong, on a stiff 3-4 in. long petiole jointed at the apex, obtuse or acute at the base, shortly and abruptly acuminate or apiculate, entire, firmly coriaceous, very glossy on both sides, shortly 3-nerved at the base, the lateral nerves all tolerably parallel and more approximate than in the preceding species, often somewhat obscure, the net-veination close, elegant, more or less obsolete or rarely conspicuous; receptacles sessile or nearly so, by pairs in the axils of the leaves or above the scars of the fallen ones, globular, the size of a pepper-kernel or very small pea, yellowish, with white pustules, glabrous, 3- or 4-bracted at the base, the bracts persistent, broad, rounded, scarious, brown, glabrous.

Var. 1, **geniculata proper:** leaves obsoletely net-veined; receptacles sessile, the bracts persistent.

Var. 2, **abnormalis:** leaves more prominently net-veined; receptacles on very short, thick, greyish pubescent peduncles, the bracts all or partially deciduous.

HAB.—Both varieties common in the mixed and low forests all over Pegu and Martaban down to Tenasserim.—Fr. March-Apr.—l.—SS.=∞ and epiphytical.

20. **F. insignis,** Kz.—An evergreen (?) tree (30—40 + 8—12 + 3—4), the softer ends of the scared robust branchlets shortly tomentose; stipules broadly ovate, tomentose; leaves very like those of the preceding species, elliptical to ovate-oblong, on a 2-3 in. long petiole jointed at the apex, rounded or obtuse at the base, 5-7 in. long, blunt-apiculate, entire or somewhat waved, glabrous, firmly coriaceous, glossy above, the lateral nerves tolerably parallel and somewhat approximate, arcuately uniting towards the margin, almost impressed, the net-veination close, hardly prominent and elegant; receptacles on thick, very short, tomentose peduncles, arising usually by pairs from the axils of the leaves or from above the scars of the fallen ones, globular or nearly so, the size of a very small cherry, villous, greyish white, with rose-coloured dots, bracted at the base, the bracts persistent, broadly ovate, scarious, brown, glabrous.

Hab.—Rather rare in the dry forests of Prome district.—Fr. March.—l. —SS.=CaS.

21. **F. Rumphii,** Bl. (*F. cordifolia,* Roxb.; Brand. For. Fl., 416, t. 48).—*Nyoung-hpyoo.*—A tree (50—60+15—20+6—8), shedding leaves in H.S., with a dense large crown, the stems usually root-netted, all parts quite glabrous; bark grey, rather smooth, minutely lenticellate, about $\frac{2}{3}$ in. thick; cut flesh-coloured, milky; stipules long, linear-lanceolate, acuminate, glabrous; leaves broadly cordate, with the base more or less truncate and often shortly narrowed at the joint of the 2-3½ in. long petiole, gradually acuminate, 4-7 in. long by 3-4 broad, more or less scalloped-waved, thin-coriaceous, glabrous, opaque on both sides, minutely dotted on the upper side, 5-7-nerved at the base, the lateral nerves thin and arcuately uniting near the margin, without any or with very faint net-veination between them; receptacles sessile, usually by pairs in the axils of the leaves or above the scars of the fallen ones, globular, the size of a very small cherry, whitish, turning black when over-ripe, glabrous, bracted at the base, the bracts persistent, broad but small, glabrous.

Hab.—Common in the savannahs and lower mixed forests from Chittagong, Ava, and Martaban down to Tenasserim; also entering the tidal forests.—Fr. Jan.-March.—l.—SS.=*All.*

Remarks.—Wood pale-coloured, soft, and useless.

22. **F. caloneura,** Kz.—Apparently a tree of the habit of the preceding, all parts glabrous; leaves similar to those of *F. Rumphii,* cordate-ovate, gradually and bluntish acuminate, cordate at the base, on a 3-4 in. long petiole with 2 conspicuous glands at the jointed apex, 4-5 in. long by 2½-3½ broad, coarsely and remotely repand-toothed, thin-coriaceous, glabrous, opaque on both sides, not dotted on the upper side, the lateral and the basal nerves all diverging and somewhat arcuate, pale-coloured, strong, faintly arcuate-united along the margin, the transverse net-veination elegant, but rather faint; fruits unknown.

Hab.—Burma, without locality.

23. **F. religiosa,** L.; Bedd. Sylv. Madr., t. 314; Brand. For. Fl., 415.—*Nyoung-bau-di.*—A leaf-shedding tree (50—60+15—20+4—6), with a dense spreading crown, all parts quite glabrous or the branchlets downy; bark rather smooth, ash-coloured; stipules lanceolate, glabrous or pubescent; leaves broadly ovate with a more or less truncate base, abruptly and finely acuminate, on a slender 3-3½ in. long petiole jointed at the apex, 5-6 in. long by 3-4 broad, more or less scalloped-waved, rigidly but thinly coriaceous, smooth and very glossy, not dotted on the upper side, 5-7-nerved at the base, the lateral nerves rather crowded and arcuately

uniting near the margin, the net-veination lax ; receptacles depressed-globular, the size of a large pea or somewhat larger, when fully ripe turning blackish, glabrous, sessile, usually by pairs in the axils of the leaves or above the scars of the fallen ones, 4-5-bracted at the base, the bracts persistent (at least the inner ones), broad and conspicuous, smooth or shortly pubescent.

Hab.—Rare in the moister upper mixed forests along choungs in the Pegu Yomah ; sometimes cultivated in villages.—s.×l.—SS.=SiS., etc.

Remarks.—Wood uniformly yellowish white, very light, coarsely fibrous, perishable, takes an inferior polish.

× × Receptacles various, sessile or peduncled, often narrowed or constricted in a stalk, the mouth usually furnished with more than 3 scales variously arranged and somewhat spreading or erect (never closely accumbent), and thus shewing also the inner bracts. Male flowers with 2-6 (rarely 1) stamens. Stigma various, usually funnel-shaped and laterally produced in 1 or 2 short lobes.

24. **F. triloba,** Ham.—An evergreen tree (20—30 + 8—12 + 2—3), all softer parts brown- or tawny-hispid ; stipules appressed-pubescent or hirsute, ovate-oblong, acuminate ; leaves variable, on a very hirsute petiole varying in length from ½ to 4 in. and more, ovate, cordate or oblong in outline, more or less 3-5-lobed, with the lobes acute or blunt, rounded or cordate at the palmately 5-7-nerved base, shortly and rather abruptly acuminate, 6-12 in. long, serrate, membranous, hirsute above, densely and rather softly hirsute-pubescent beneath ; receptacles turbinate-globular, umbonate, sessile, more or less hirsute from stiff tawny hairs, varying in size from that of a small cherry to nearly ½ in. in diameter, occasionally with some rather large bracts at its circumference, by pairs or solitary in the axils of the leaves or above the scars of the fallen ones ; bracts large, ovate, acuminate, about 3-4 lin. long, appressed-pubescent.

Hab.—Frequent in the damp hill forests and freely springing up in deserted hill toungyas in the Martaban hills, at 3,000 to 5,000 ft. elevation.—Fr. March —s.—SS.=Metam.

25. **F. hirta,** Vhl.—An evergreen tree (15—20 + 6—10 + 1—2), the branches hispid ; stipules lanceolate, acuminate, hispid on the back ; leaves 3-lobed or undivided, in general outline obovate to obovate-oblong, cordate or rounded at the base, along with the lobes acuminate, 6-9 in. long, on a shortly hispid petiole ½-¾ in. long, serrate-toothed, sparingly hispid above, beneath rather softly but thinly pubescent, 3-nerved at the base, and often with 2 additional shorter nerves; receptacles turbinate-ovoid to almost

globular, umbonate, the size of a small cherry or smaller, shortly hispid and more or less glabrescent, crimson-orange, sessile, by pairs or more usually solitary in the axils of the leaves or above the scars of the fallen ones; bracts triangular-ovate, only about a line long, acute, pubescent.

Hab.—Frequent in the drier and damp hill forests of Martaban, and here often springing up in deserted toungyas, at elevations from 3,000 to 4,000 ft.—s.×l.—SS.=Metam.

26. **F. chrysocarpa,** Rwdt.—An evergreen tree (30—40+12—20+3—5), the young branches brown- or tawny-tomentose and pubescent; stipules lanceolate, acuminate, appressed-pubescent; leaves obovate-oblong to obversely oval, on a yellowish pubescent slender petiole 1-1½ in. long, obtuse or acute at the base, shortly acuminate or almost apiculate, minutely repand-toothed or almost entire, 6-8 in. long, membranous to firmly membranous when adult, rough above from short stiff hairs, shortly and softly pubescent beneath, 3-nerved at the base and penninerved, when full-grown strongly transversely veined and net-veined; receptacles globular or nearly so, umbonate, the size of a small or large cherry, crimson when fully ripe, yellowish pubescent from short stiff hairs, sessile or nearly so, solitary or by pairs in the axils of the leaves or more usually above the scars of the fallen ones; bracts very small, ovate.

Hab.—Rare in the damp hill forests of Martaban east of Tounghoo, at about 4,000 ft. elevation.—Fr. March.—s.—SS.=Metam.

27. **F. lepidosa,** Wall.—An evergreen tree (30—43+12—20+3—4), the young shoots sparingly pubescent; stipules linear-lanceolate, long-acuminate, glabrous or nearly so; leaves obovate to elliptical, on a slightly pubescent glabrescent petiole 1-2 in. long, obtuse at the base, shortly acuminate, 5-6 in. long, firmly membranous, above glabrous or sprinkled with a few short hairs, beneath thinly and shortly pubescent, almost penninerved; receptacles turbinate-globular, umbonate, shortly pubescent, orange-crimson, the size of a cherry, on 3-5 lin. long, strong, pubescent peduncles, arising usually by pairs from the axils of the leaves or above the scars of the fallen ones; bracts ovate, acute, glabrous, about a line long.

Hab.—Southern spurs of the Pegu Yomah, in moist forests.—Fr. June.—s.—SS.=Lat. p.

28. **F. pubigera,** Wall.; Brand. For. Fl., 424.—A tree, the young shoots slightly appressed-pubescent; stipules linear-lanceolate, acuminate, tawny-pubescent; leaves oblong-lanceolate to oblong, rounded or acute at the base, rather abruptly acuminate, membranous to chartaceous, 3-4 in. long, on a brown strong petiole 3-6 in. long, entire, while young fugaceously puberulous beneath,

soon glabrescent, 3-nerved at the base and penninerved, the net-veination thin and lax, brown-dotted and variegated between; receptacles globular, the size of a small cherry, umbonate, more or less sprinkled with small lenticels, orange-coloured, covered with a very fugaceous down, sessile or nearly so, solitary or by pairs in the axils of the leaves; bracts 3, broadly triangular, pubescent persistent.

HAB.—Martaban hills, at 4,000 ft. elevation.

29. **F. Lamponga,** Miq.—A shrub, the young shoots shortly appressed-bristly; stipules linear-lanceolate, acuminate, pubescent; leaves oblong-lanceolate to elongate-oblong, rounded at the base, acuminate, 5-8 in. long, on an appressed-hispid petiole ½-1 in. long, entire, membranous, above sprinkled with minute bristles, beneath pale-coloured and on the nerves appressed-setulose, 3-nerved at the base, with 9-11 thin but rather prominent nerves at each side, transversely veined and indistinctly net-veined; receptacles not seen.

Var. 1, **Lamponga proper**: leaves rounded at the base, the petiole and nervation beneath appressed bristly-pubescent.

Var. 2, **chartacea**: leaves usually more obovate-lanceolate, on longer glabrous petioles, glabrous; receptacles globular, the size of a pea, glabrous, on a very short (1-1½ lin.) peduncle bracted at the apex, by pairs in the axils of the leaves.

HAB.—Both varieties in Upper Tenasserim; the var. 2 apparently frequent.—Fr. Jan.-Apr.

30. **F. excelsa,** Vhl.—*Nyoung-tha-bye.*—An evergreen tree (30—40+10—15+3—5), often stem-clasping and epiphytic, and covering the trunks of other trees with a perfect net-work, all parts glabrous or nearly so; bark about a line thick, grey, corky-pustulate; cut greenish, milky; stipules linear, acuminate, glabrous; leaves extremely varying from oblong to elliptically lanceolate and almost equal to obovate-oblong and linear-lanceolate, and even rhomboid-oblong and more or less unequal, acute or obtuse at the base, apiculate or blunt, with or without a mucro, 2-6 in. long, on a thick petiole 3-5 lin. long, entire, waved or gibbose, more or less coriaceous, glabrous, 3-plinerved, the few (4-5 on each side) nerves all discolored, hardly prominent, the discolored lax veination immersed on the brownish or nearly yellow under-surface; receptacles globular or pear-like-globular, umbonate, somewhat rough, varying in size from that of a pea to that of a small cherry, rather abruptly narrowed in a more or less slender stalk 2-4 lin. long, sessile, green, then orange-coloured, usually by pairs in the axils of the leaves or

above the scars of the fallen ones, at the insertion of the stalk furnished with 4-5 small, ovate, glabrous, persistent bracts.

Hab.—Rather frequent in the tropical and mixed forests, especially in the vicinity of choungs, along the eastern slopes of the Pegu Yomah and of Martaban; also Chittagong and the Andamans.—Fr. Feb.-May.—s.: l.—SS.=Metam. SiS.

Remarks.—Wood yellowish, rather light, coarsely fibrous, rather close-grained.

31. **F. radicans,** Roxb.—An evergreen shrub, usually scandent, the young branchlets minutely hispid and rough; leaves from oblong and elliptical to obovate-oblong, somewhat unequal and often angular expanded to almost rhomboid-obovate, acute or obtuse at the base, on a rough petiole 3-4 lin. long, rather abruptly produced into a bluntish, long, tail-shaped acumen, 2-4 in. long, rigidly chartaceous, glabrous, or a little rough beneath, 3-nerved at the base, with only 3-4 lateral nerves at each side, which are very prominent beneath and unite with the strong veins and net-veination; receptacles globular or nearly so, the size of a large pea or larger, umbonate, very rough from minute appressed bristles, orange-coloured, with paler spots, abruptly contracted into a slender very rough stalk of 3-4 lin. in length, sessile, usually by pairs in the axils of the leaves, with minute, ovate, acute, persistent bracts at the insertion of the stalk.

Var. 2, **abnormis**: leaves of a thinner texture, green, obscurely crenate-toothed upwards; receptacles smooth, short-peduncled, with 3 bracts at the base, but not stalked. Similar to *F. obtusidens*, but the receptacles appear *peduncled* (possibly stalked, with the bracts moved upwards?).

Hab.—Upper Tenasserim; var. 2: in old toungyas of Martaban east of Tounghoo.—Fr. March.

32. **F. subulata,** Bl.—An evergreen large scandent shrub, all parts glabrous; stipules linear-subulate, about $\frac{1}{3}$-$\frac{1}{2}$ in. long and longer, glabrous; leaves oblique, elliptical to oblong-lanceolate, acute at the unequal base, on a 1-2 lin. long petiole, long but bluntish acuminate, entire or obscurely repand-toothed, glabrous, firmly membranous, pale-coloured beneath, the basal nerves very short, the lateral ones somewhat crowded (11-12 on each side), slightly curved and obscurely anastomosing, the net-veination thin and lax; receptacles globular, the size of a pea, umbonate, orange-yellow, with white dots, frequently with 1-3 bracts indifferently arising from the circumference, glabrous, abruptly narrowed into a slender stalk 1-2 lin. long, bearing 1 or 2 bracts along its length and similar ones at its base; bracts minute, ovate, acute, glabrous.

Hab.—In the tropical forests of Martaban and along the eastern slopes of the Pegu Yomah.—Fr. March-Apr.

33. **F. uniglandulosa,** Wall.—An evergreen low shrub, 2-3 ft. high, the branchlets shortly appressed-hispid; stipules lanceolate-subulate, appressed-pubescent; leaves obovate-lanceolate to obovate-oblong, somewhat cuneate at the base, on a strong, roughish, brown petiole 2-3 lin. long, shortly and rather bluntish acuminate, remotely and bluntish repand-serrate, 3-4 in. long, thick chartaceous, glabrous, with 6-7 nerves at each side anastomosing along the margin, transversely veined; receptacles globular, umbonate, the size of a pea, crimson, sprinkled with short stiff hairs, narrowed into an appressed-hispid stalk, sessile or nearly so, and usually solitary in the axils of the leaves.

Hab.—Along choungs in the Pegu Yomah.—Fr. Jan.

34. **F. vasculosa,** Wall.—An evergreen tree, about 30-35 ft. high, all parts quite glabrous; stipules lanceolate, glabrous; leaves from elliptical and oblong to obovate-oblong, acute or obtuse at the base, 4-8 in. long, shortly and blunt-acuminate or apiculate, rarely blunt, on ½-1½ in. long petiole jointed at the apex, entire or waved, rigidly chartaceous, glabrous, especially above very glossy and almost as if varnished, in a dried state beautifully green or yellowish green, shortly 3-nerved at the base, the lateral nerves numerous, and along with the rather lax but elegant net-veination strongly prominent on both sides; receptacles globular, umbonate, the size of a large pea, glabrous, abruptly narrowed in a stalk varying in length from ½-2-3 lines, on slender glabrous peduncles 2-3 lin. long, arising usually by pairs from the axils of the leaves; bracts 3, persistent, minute, triangular, at the end of the peduncle.

Hab.—Tenasserim.—Fr. Dec.

35. **F. nervosa,** Heyne; Bedd. Sylv. Madr., 223.—*Nyoung-peing-nai-pen.*—An evergreen tree (40—60+20—25+8—10), all parts glabrous or the soft shoots indistinctly canescent; bark about ½ in. thick, even, brittle, brownish grey; cut brownish, milky; stipules lanceolate, acuminate, glabrous or rarely pubescent; leaves varying from oblong and elliptical to elongate- and obovate-oblong, rounded or acute at the base, on a ½-1½ in. long petiole, 3-8 in. long, bluntish and often rather abruptly acuminate, entire, chartaceous, glabrous and glossy, turning brownish in a dried state, the lateral nerves prominent and arcuately uniting, the thin net-veination lax and prominent on both sides; receptacles globular or nearly so, the size of a very large pea or larger, abruptly narrowed into a slender longer or shorter (3-5 lin.) stalk, glabrous, orange-coloured, sessile or only on a very short peduncle, arising usually by pairs from the axils of the leaves; bracts 3, persistent or deciduous, minute, at the base of the stalk.

Hab.—Not unfrequent in the tropical forests of Chittagong, Pegu, and Martaban down to Tenasserim, especially along choungs.—Fr. May-Aug.—s.—SS.=Metam. SiS.

Remarks.—Wood yellowish or white, with darker-coloured annular rings, turning brownish, rather light, of a coarse fibre, rather close-grained, soft, soon attacked by xylophages.

36. **F. callosa,** Willd.—An evergreen tree (40—60+20—30+5—8), but fruiting already while still a shrub, all parts glabrous; stipules lanceolate, appressed-pubescent; leaves oblong to elliptical, rounded or obtuse at the base, on a thick petiole ½-3 in. long, blunt or bluntish and obscurely apiculate, 6-8 in. (in saplings 1-1½ ft.) long, thin-coriaceous, entire, glabrous, yellowish green, beneath somewhat roughish to the touch, the lateral nerves strong and prominent, curved and uniting, the net-veination lax; receptacles almost turbinate-globular, the size of a large cherry, abruptly contracted in a short stalk or almost sessile, minutely puberulous, on puberulous peduncles ½-1 in. long, usually solitary or by pairs in the axils of the leaves; bracts persistent, small, triangular, concave, opposite, puberulous.

Hab.—In the tropical forests of the eastern slopes of the Pegu Yomah, more frequent in those of Martaban and Tenasserim down to the Andamans.—Fr. Apr.-May.—s.—SS.=Metam. SiS., etc.

Remarks.—Wood yellowish grey, light, coarsely fibrous, rather close-grained, takes a tolerably good mottled polish.

37. **F. ramentacea,** Roxb.—An evergreen large stem-clasping shrub, climbing high up into the trees, the young shoots brown, sparingly and shortly puberulous; stipules ovate-lanceolate, greyish pubescent; leaves ovate to elliptically ovate, on a strong indistinctly puberulous petiole ½-¾ in. long, rounded at the base, acute to shortly acuminate, 5-7 in. long, rigidly coriaceous, entire, glabrous or (especially while young) sparingly appressed-hairy on the midrib; receptacles globular or somewhat depressed-globular, the size of a small cherry, slightly umbonate, bright crimson, glabrous, narrowed into a short stalk, on short 1-1½ lin. long peduncles, solitary or by pairs in the axils of the leaves or above the scars of the fallen ones; bracts 3, at the apex of the peduncle, deciduous, glabrous.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah; also Chittagong.—Fr. March-Apr.—s: l.

38. **F. pomifera,** Kz.—An evergreen scandent shrub, all parts glabrous; stipules linear-lanceolate, glabrous; leaves obovate or somewhat rhomboid-obovate, on a roughish petiole 3-4 lin. long, almost cuneate at the base, 1-2½ in. long, blunt or somewhat notched, glabrous, coriaceous, with the borders somewhat recurved,

lacunose-dotted between the obsolete net-veination, the 4 or 5 nerves at each side little prominent; receptacles nearly 1¼ in. in diameter, apple-shaped, slightly umbonate, smooth, crimson-orange, contracted in a very short (about ½ lin.) thick stalk, on a thick minutely pubescent peduncle 1-2 lin. long, arising usually singly from the axils of the leaves or from above the scars of the fallen ones; bracts 3, at the apex of the peduncle, persistent, triangular-ovate, almost glabrous.

Hab.—Upper Tenasserim.—Fr. Apr.

39. **F. scandens,** Roxb.; Brand. For. Fl., 421.—An evergreen, rooting, large, scandent shrub ascending into trees up to 80 ft. high, the young shoots appressed and shortly but sparingly pubescent or glabrous; stipules glabrous, linear-subulate; leaves elliptically ovate to ovate, on a brown roughish petiole 3-5 lin. long, bluntish to bluntish acuminate, obtuse at the base, 2-4 in. long, coriaceous, glabrous or a little roughish, or beneath on the midrib sparingly appressed pubescent, triplinerved, with 3-4 strongly prominent nerves at each side, the veins obsolete with tessellate whitish net-veination between; receptacles globular or nearly so, not or abruptly contracted into a very short stalk, the size of a very large pea or larger, umbonate, crimson, rough, on 3-4 lin. long glabrous peduncles arising by pairs from the axils of the leaves or from above the scars of the fallen ones; bracts 3, calyx-like, terminating the peduncle.

Hab.—Not unfrequent in the tropical forests from the Pegu Yomah and Martaban down to Tenasserim and the Andamans.—Fr. March-Apr.

40. **F. scabrella,** Roxb.—An evergreen, low, prostrate or ascending shrub, the branchlets shortly and softly pubescent; stipules very small, ovate, somewhat pubescent on the back; leaves oblong to obovate-oblong, rounded at the somewhat narrowed base, acute or shortly acuminate, 2-3 in. long, repand-toothed, firmly membranous, on both sides shortly rough-pubescent; receptacles obversely ovoid, the size of a cherry or prune, perforated-umbonate, crimson, covered with white lenticel-like asperities, not or indistinctly contracted in a very short stalk, on strong rough-pubescent peduncles 1½-2 lin. long, arising usually from above the scars of the old fallen leaves; bracts 3, at the apex of the peduncle, short and scale-like.

Hab.—Chittagong.

41. **F. anastomozans,** Wall.—An evergreen, low, creeping shrub, all softer parts more or less rough-pubescent; stipules minute, rough; leaves oblong-lanceolate, acute or obtuse at the base, on a roughish pubescent petiole 2-6 lin. long, more or less bluntish acuminate, 2-4 in. long, grossly and irregularly sinuate-toothed with

the teeth rounded or blunt, roughish pubescent or somewhat glabrescent above, membranous, the numerous lateral nerves rectangularly diverging and anastomosing, sending out nervelets terminating in the teeth; receptacles ovoid, the size of a pepper-kernel, umbonate, not or hardly constricted at the base, shortly rough-pubescent, on very short (hardly ½ a line) pubescent peduncles arising solitary from the axils of the leaves or from above the scars of the fallen ones; bracts minute.

HAB.—Upper Tenasserim.—Fr. Feb.

42. **F. heterophylla,** L. f.; Brand. For. Fl. 424.—An evergreen creeping or sometimes ascending shrub, the stems more or less pubescent; stipules ovate, almost glabrous or pubescent; leaves variable, in general outline usually more or less ovate, simple, shortly lobed to deeply 3- to many-lobed, sometimes much elongate and oblong-linear with the lobes equally narrowed and prolonged, more or less cordate at the base, waved-repand to sharply toothed, 2-5 in. long, blunt and acute to acuminate, membranous, while young on both sides shortly pubescent, turning harshly pubescent with age, more or less palmately 3- to 5-nerved at the base; receptacles pear-shaped, often elongate, perforated-umbonate, the size of a small cherry, tapering into an elongate stalk, somewhat rough, crimson-orange, on peduncles varying in length from a few lines to an inch and arising constantly singly from the axils of the leaves; bracts minute, triangular-ovate, at the apex of the peduncle, glabrous.

HAB.—Common along the banks of larger rivers and choungs all over Burma from Chittagong and Ava down to Upper Tenasserim.—Fr. Apr.-June.—l+s.—SS.=*All.* SiS.

43. **F. ischnopoda,** Miq.—An evergreen bushy shrub, 2-4 ft. high, all parts glabrous; stipules linear-subulate, glabrous; leaves linear-lanceolate to linear, obtuse at the base, on a glabrous petiole 2-3 lin. long, long and bluntish acuminate, entire, 4-5 in. long, firmly membranous, quite glabrous, the nerves thin and uniting, the net-veination rather lax and impressed; receptacles pear-shaped, umbonate, about ⅔ in. long, crimson-orange, quite smooth, narrowed at the base, on smooth peduncles 3-6 lin. long, arising singly from the axils of the leaves; bracts 3, triangular, concave, glabrous, persistent at the apex of the peduncle.

HAB.—Not unfrequent along the rocky bed of hill choungs of the Pegu Yomah.—Fr. Feb.—l.—SS.=SiS.

44. **F. subpyriformis,** Miq.—An evergreen shrub, 3-4 ft. high; stipules linear-lanceolate, acuminate, pubescent outside; leaves linear-lanceolate, acute at the base, on a rather thick pubescent petiole 3-4 lin. long, 4-6 in. long, acuminate, rigidly membranous, entire, glabrous above, pubescent and somewhat greyish beneath,

the nerves thin, arcuate and anastomosing, the net-veination lax; receptacles pear-shaped, up to ⅔ in. long, umbonate, narrowed into a short stalk, shortly pubescent, on strong pubescent peduncles 2-3 lin. long, arising usually singly from the axils of the leaves; bracts 3, at the apex of the peduncle, broadly triangular, acute, glabrous, except on the back towards the base.

Hab.—Martaban hills east of Tounghoo.—Fr. March-Apr.

* * *Receptacles arising in clusters, by pairs or in racemes or spikes from tubercle-like reduced branchlets or from bracted shoots from the roots or the trunk* (*in a few species arising at the same time also from the axils of the leaves*).

45. **F. pyrrhocarpa,** Kz.—An evergreen low shrub, 1-4 ft. high, the branchlets covered with stiff appressed brown hairs; stipules linear-lanceolate, acuminate, tolerably glabrous or pubescent on the back; leaves obversely lanceolate to almost cuneate-lanceolate, acute or cuneate at the base, on an appressed-pubescent glabrescent petiole of a few lines to 1½ in. in length, shortly and rather bluntish acuminate, entire, above glabrous or sprinkled with minute short inconspicuous hairs, beneath on the nerves sparingly appressed-hirsute and more or less glabrescent, thick-membranous, the nerves arcuate, the net-veination lax; receptacles depressed pear-shaped, the size of a cherry, purplish green, ribbed, furnished with several scales arising variously from the circumference, especially while young covered with stiff appressed or half-spreading brown or reddish brown hairs, on strong pubescent peduncles ¼-1¼ in. long, arising singly from the subterranean stems or from subterranean shoots; bracts 3, at the apex of the peduncle, short, ovate.

Hab.—Common amongst rocks and shingles in the hill streams of the Pegu Yomah and the Martaban hills.—Fr. Jan.-Feb.—l.—SS.=Metam. SiS.

46. **F. lanceolata,** Roxb.—*Ye-tha-hpan.*—An evergreen large shrub 5-8 ft. high, sometimes growing out into a small tree, all parts glabrous; stipules linear-lanceolate, acuminate, glabrous; leaves linear-oblong to linear-lanceolate, obtuse at the base, slightly acuminate, on a glabrous petiole ½-1 in. long, firmly membranous, entire, glabrous, the nerves somewhat curved, the rather lax net-veination almost immersed; receptacles depressed-pear-shaped, about ⅔ in. in diameter, ribbed, furnished with some bracts arising chiefly on the upper parts towards the mouth, glossy, purplish with white pustules, shortly contracted at the base, on a glabrous 4-6 lin. long peduncle, several together arising from tubercle-shaped reduced shorter or longer branchlets along the trunk and near the

root; bracts 3, unequal, at or near the apex of the peduncle, ovate, glabrous.

Hab.—Chittagong.—Fr. end of H.S.

47. **F. ribes,** Rwdt.—An evergreen tree (25—30 + 6—12 + 1—3), the young shoots slightly appressed-pubescent; stipules linear-lanceolate, acuminate, shortly appressed-pubescent; leaves oblong-lanceolate to lanceolate, unequally sided, on a pubescent petiole 1-2 lin. long, acute at the base, 2-3½ in. long, acuminate, membranous, glabrous, or shortly appressed-pubescent on the mid-rib beneath, penninerved; receptacles obovate to turbinate-obovate, the size of a pea, green, smooth, usually furnished with several or sometimes numerous scales on the circumference, tapering into a short stalk, on glabrous peduncles 2-3 lin. long, arising in pairs racemosely along the branched leafless shoots from the trunk or the roots, or more crowdedly from branched short clusters of reduced branchlets; bracts 3, minute, triangular-ovate, glabrous.

Hab.—Southern Tenasserim.—Fr. Oct.

48. **F. glomerata,** Willd.; Bedd. Sylv. Madr. 224.—*Ye-tha-hpan.*—An evergreen tree (50—60 + 10—25 + 4—12), all parts glabrous; bark grey, rather smooth; stipules linear-lanceolate, acuminate, glabrous; leaves from oblong to obovate-oblong and oblong-lanceolate, rarely linear-oblong, on a glabrous petiole of various length (3-4 lin. up to 2½ in.), acute or obtuse at the base, 4-9 in. long, apiculate to bluntish acuminate, entire, membranous, glabrous, penninerved, usually more or less 3-nerved at the base; receptacles large, the size and shape of a common pear, sometimes obversely turbinate-globular, smooth and glossy, purplish or blood-red, on glabrous 1½-2 in. long peduncles, arising in smaller or larger clusters from tubercle-like reduced branches on the trunk or on the stouter branches; bracts 3, at the apex of the peduncle, triangular-ovate, rather deciduous.

Hab.—Common in all mixed and the tropical forests, almost always along choungs, all over Burma.—Fr. C.S.—s. × l.—SS. = ∞.

Remarks.—Wood pale brown, coarsely fibrous, light and perishable. □′ = 27 pd.

49. **F. Chittagonga,** Miq.—*Tha-hpan-ben.*—An evergreen tree (40—50 + 10—15 + 4—6), the young parts puberulous; bark grey; stipules minutely pubescent, linear-lanceolate, acuminate; leaves ovate to ovate-oblong and oblong-lanceolate, rounded or obtuse at the base, on a sparingly appressed-pubescent petiole ½-1 in. long, 2½-4 in. long, very shortly and bluntish acuminate or almost apiculate, entire, membranous, glabrous or slightly pubescent along the nerves beneath; receptacles ovoid-pear-shaped, about

an inch or less in diameter, glabrous and smooth, umbonate, not or slightly constricted at the base, on a very short (1-2 lin. long) pubescent thick peduncle arising from branched reduced branchlets on the trunk and on the stronger branches; bracts 3, broad, rounded or triangular, pubescent, persistent at the apex of the peduncle.

Hab.—In the savannah forests of Pegu; also Chittagong.—Fr. close of R.S.—l.—SS.=All.

50. **F. fistulosa,** Rwdt.—An evergreen tree (25—35+8—10+2—3), all parts glabrous, or the young branchlets sparingly appressed-hairy; bark brown, about ¼ in. thick; cut brown, milky; stipules lanceolate, acuminate, glabrous; leaves obovate-elliptical to oblong, more or less acute at the usually unequal base, on a glabrous petiole ½-2 in. long, 6-9 in. long, apiculate to thinly but bluntish acuminate, thick-membranous, glabrous, penninerved, transversely veined and net-veined; receptacles turbinate-globular to somewhat depressed-globular, umbonate, the size of a cherry, green or brownish, somewhat scaly-rough, on somewhat rough 1-1½ in. long peduncles, arisiug from short branched, drooping, scared branches on the trunk; bracts 3, triangular, blunt at the apex of the peduncle.

Hab.—Not unfrequent in the tropical forests, especially along choungs, from Martaban down to Tenasserim; also occasionally along the eastern slopes of the Pegu Yomah.—Fr. March-Apr.—s.—SS.=SiS. *Metam.*

Remarks.—Wood greyish pale brown, heavy, of a coarse but close fibre.

51. **F. macropoda,** Kz.—An evergreen tree (30—40+12—15+3—4), all parts glabrous, the branchlets hollow; stipules linear-lanceolate, glabrous; leaves obovate-oblong, rounded at the somewhat narrowed base, on a rather stiff but slender glabrous petiole 1-2½ in. long, shortly and rather bluntish acuminate, 6-12 in. long, entire or obsoletely waved-crenate, thin-chartaceous, glabrous, penninerved and shortly 3- or almost 5-nerved at the base, the nerves uniting towards the margin; receptacles globular or nearly so, umbonate, constricted in a short stalk, glabrous, green, the size of a small cherry, on slender glabrous peduncles up to nearly an inch long, arising in dense clusters from tubercle-like reduced branches along the trunk and coarser branches, and often also in pairs from the leaf-axils; bracts 2 or 3, minute, at or towards the apex of the peduncle.

Hab.—In the tropical forests of South Andaman.—Fr. Apr.-May.—s.—SS.=SiS., etc.

Remarks.—Wood soft, white.

52. **F. regia,** Miq.—An evergreen tree (30—40+10—12+3—5), all parts glabrous; bark grey, 2-3 lin. thick, roughish from corky pustules; cut reddish, milky; stipules lanceolate, acumi-

nate, glabrous; leaves elliptical to elliptically ovate and obovate-oblong, ½-1 ft. long by about 4-6 in. broad, obtuse or rounded at the base, on a rather slender glabrous petiole 1½-3½ in. long, bluntish to acute, membranous, glabrous, coarsely and remotely crenate-serrate, 3-nerved at the base, and usually with 2 fainter additional nerves, the lateral nerves thin, but prominent, the transverse veination very thin; receptacles as large as an apple and almost of the same shape, with a scaly umbo round the mouth, not or only inconspicuously contracted at the base, shortly tomentose, red, on slender puberulous peduncles 2-3 in. long, several together arising from reduced tubercle-like branches along the trunk and the branches; bracts 3, ovate, pubescent.

Hab.—Frequent in the tropical forests of the Martaban hills and Upper Tenasserim.—Fr. Apr.—s.—SS.=Metam.

Remarks.—Wood brown, rather light, coarsely fibrous, perishable.

53. **F. Roxburghii,** Wall.; Brand. For. Fl., 422.—*Sin-thalpan.*—An evergreen tree (25—35+4—2+6—5), the younger parts pubescent; bark grey, sprinkled with little warts; cut milky; stipules ovate-lanceolate, pubescent; leaves ample, cordate-rotundate to elliptically cordate, up to 1½ ft. long by 1 broad, cordate at the base, on a strong pubescent petiole 2-3 in. long, acute or shortly acuminate, firmly membranous to almost thin-coriaceous, entire or nearly so, glabrous above, especially while young pubescent beneath, strongly 5-nerved at the base and usually with 2 additional short nerves, transversely veined and laxly and thinly net-veined; receptacles large, 2-2½ in. in diameter, depressed-pear-shaped, with a scaly umbo round the mouth, shortly narrowed at the base, dirty-purple, more or less tomentose, on strong pubescent petioles ¾-1½ in. long, arising several together in clusters from short radical branchlets or from the lower part of the trunk; bracts 3, broadly 3-angular-ovate.

Hab.—Not unfrequent, especially along choungs in, the tropical forests of Martaban and Chittagong.—Fr. Apr.-May.—s.—SS.=Metam.

Remarks.—Wood coarse, white.

54. **F. hispida,** L. f.; Bedd. Sylv. Madr., 224; Brand. For. Fl., 423.—*Ka-dot.*—An evergreen tree (20—30+5—12+3—4), often remaining a large shrub, all parts roughish pubescent; stipules lanceolate, acuminate, pubescent; leaves usually opposite, from elliptically obovate to ovate and ovate-oblong, rounded or obtuse at the base, apiculate or shortly and abruptly acuminate, on a hispid or pubescent petiole ½-1½ (in young leaves up to 3) in. long, 6-9 in. long, repand-serrulate, sparingly hispid or harsh and rough above, beneath more or less roughish pubescent, penninerved (the basal

nerves sometimes appearing more or less triplinerved), transversely veined and net-veined between the prominent nerves; receptacles varying in shape from almost pear-shaped-ovoid to globose-ovoid, umbonate, with or without stray scales especially towards the apex, the size of a cherry, yellowish, pubescent from greyish or brownish short hairs, a little narrowed at the base, on greyish or tawny pubescent peduncles 2-5 lin. long, arising from leafless scaly radical roots and lower parts of the trunk and also in pairs or solitary in the axils of the leaves; bracts 3, small, ovate-triangular, pubescent, at the apex of the peduncle.

Hab.—Common in the mixed, especially the upper and savannah, forests all over Burma from Ava and Chittagong down to Tenasserim and the Andamans, up to 1,000 ft. elevation.—Fr. D.S.—l.—SS.=∞. *SiS.*

55. **F. cunia,** Buch.; Bedd. Sylv. Madr. 224, Brand. For. Fl. 421.—*Ye-kha-ong.*—An evergreen tree (30—50+10—15+3—4), the softer shoots roughish pubescent; bark red-brown; leaves oblong to obovate-oblong, sometimes oblong-linear, conspicuously cordate-produced at the base of the one side, acute at the other, on a strong hirsute petiole 1-1½ in. long, acuminate, ½-1 in. long, more or less repand-serrate or sometimes almost entire, rigidly membranous, more or less harsh above, harshly and shortly pubescent beneath, penninerved at the one side of the base and shortly 3-4-nerved at other; receptacles from turbinate- to pear-shaped-globular, the size of a cherry, umbonate, shortly hispid, indistinctly ribbed, more or less tubercled and often furnished with scales arising irregularly, almost sessile or on hispid-pubescent peduncles 1-5 lin. long, arising in clusters or by pairs from radical young shoots or from more or less branched scared reduced branches; bracts 3, at the end of the peduncle, ovate, tomentose or pubescent.

Var. 1, **cunia proper:** receptacles more pear-shaped, often narrowed into a short stalk, not or little tubercled, on shorter or longer peduncles.

Var. 2, **conglomerata** (*F. conglomerata,* Roxb.; Brand. For. Fl., 422, t. 49): receptacles more globular or turbinate, sessile or nearly so, much tubercled.

Hab.—Var. 1: frequent in the mixed, especially the upper mixed, forests all over Burma from Ava and Chittagong down to Tenasserim.—Fr. D.S.—l.—SS.=SiS. Metam., etc.

N. B.—Another species (*F. hapalophylla,* Kz.), very nearly allied to the above, grows in Chittagong (and Khasi hills). It is a tree with red-brown bark; the leaves are much larger and like those of *F. conglomerata,* but of a very thin texture and sparingly pubescent; syncarps ovoid-turbinate, the size of a large cherry, roughish, brown, very long (up to ¾ in.) peduncled, all from radical shoots.

DORSTENIA, Plum.

Monoecious. Flowers numerous, sessile, the males and females mixed and closely packed on a peltate explanate receptacle. Perianths tubular, all more or less united with each other, 2-4-toothed. Males: stamens 2, the filaments confluent at the base with the perianth; anthers 2-celled. Females: ovary immersed in the spongy-fleshy receptacle, sometimes stalked, with a solitary ovule; style lateral, 2-cleft, or simple and short. Seeds compressed-globular, enclosed in the fleshy pericarp almost 2-valved from the middle, and elastically ejected from it, the testa crustaceous, verrucose and crested. Embryo curved, with 2 plano-convex thick cotyledons of the length of the radicle.—Herbs or undershrubs, often succulent, rarely shrubs, with radical or cauline leaves. Receptacles peltate and peduncled, either radical and scape-like, or in the axils of the leaves.

1. **D. Griffithiana,** Kz.—An evergreen low shrub, the branchlets angular and tawny-pubescent; leaves elongate-obovate to cuneate-elliptical, on a strong pubescent glabrescent petiole ½-¾ in. long, acute or rounded at the narrowed base, 8 in. to 1¼ ft. long, abruptly acuminate, thin coriaceous, entire, smooth above, rough beneath; stipules setaceous, pubescent; flowers all immersed in the cavities of the fleshy receptacle, the receptacles head-like involucred, velvety outside, on a slender velvety peduncle arising singly from the axils of the leaves; fruit compound, dimorphous, velvety, the involucre-bracts reflexed.

Hab.—Tenasserim.—Fl. Fr. Jan.

ANTIARIS, Lesch.

Flowers monoecious, the males densely packed within a many- and imbricately-bracted involucre opening at length into an open convex receptacle. Perianth 4- or rarely 3-cleft, the segments spatulate, imbricate in the bud. Stamens 4, or rarely 3, opposite the perianth-segments; anthers extrorse. Female flowers solitary, within a many-bracted involucre, without a perianth. Ovary connate with the involucre, with a solitary pendulous ovule; style short, 2-cleft, the stigmas filiform. Fruit a drupe, the pericarp formed of the enlarged fleshy involucre. Testa chartaceous. Albumen none. Embryo with thick plano-convex cotyledons and a superior radicle.—Trees or shrubs abounding in milky juice, with entire distichous leaves. Stipules by pairs, axillary. Flower-heads axillary, clustered.

1. **A. toxicaria,** Lesch. (*A. innoxia,* Bl.; Bedd. Sylv. Madr., t. 307; Brand. For. Fl., 427).—*Hmi-á-sait.*—An evergreen tree (100—120 + 60—80 + 10—12), the branchlets glabrous or slightly pubescent and somewhat pruinous; bark an inch thick, grey, even, covered with pustules; cut pale-coloured; leaves elliptically oblong or oblong,

on a puberulous petiole 2-3 lin. long, rounded to almost cordate at the base, 4-8 in. long, acuminate, with a mucro, entire, chartaceous, glossy and somewhat rough above, beneath more or less roughish puberulous and turning almost glabrous; male receptacles concave-explanate, rounded, outside (like the strong peduncle up to ½ in. long) velvety-tomentose, usually by 3 or 4 clustered in the axils of the leaves; female receptacles pear-shaped, tapering into a very thick and short peduncle, velvety; drupes more or less oblong-pear-shaped to oblong, tapering into the 3-4 lin. long thick peduncle, with a few scale-like bracts towards the apex, otherwise even and velvety-tomentose, bright scarlet or crimson.

HAB.—Not unfrequent in the tropical and moister upper mixed forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim. —Fr. Apr.-May.—s: l.—SS.=*SiS.*, Metam.

REMARKS.—Wood pale brown, very coarse-fibrous. Exudes a white poisonous resin, used for poisoning arrows, etc. In Hindustan the inner bark is carefully removed entire from proportionally long portions of the trunk and used as sacks for rice and other articles. The renowned "upas tree" of Java.

STREBLUS, Lour.

Flowers monoecious or dioecious, the males in heads or spikes, the females solitary. Males: perianth 4-parted, the segments almost valvate in the bud. Stamens 4, opposite the perianth-segments, inserted round an ovary-rudiment, incurved in the bud, elastically spreading at the opening of the flower. Females: perianth 4-parted, the segments imbricated in a double series and crossedly opposite. Ovary with a single ovule attached near the apex; style somewhat excentrical; stigmas 2, filiform, sometimes equally long. Achene either drupe-like enclosed in the fleshy enlarged perianth, almost globular or ovoid, or exserted and surrounded at the base or wholly by the fleshy or leafy perianth. Albumen none. Embryo with fleshy often connate cotyledons.—Trees or shrubs, abounding in milky juice, unarmed or armed, with simple serrulate or toothed leaves. Stipules lateral, the inflorescences axillary.

* *Male flowers in short peduncled heads or spikes, the heads sometimes androgynous; the females solitary, peduncled; perianth-segments broad, enlarging and turning fleshy, entirely enclosing the achene.*

All parts scabrously pubescent; fruiting perianth fleshy, scabrous; male flowers in heads . . . . . *S. aspera.*

All parts glabrous and smooth; male flowers in dense spikes . *S. mitis.*

* * *Male flowers in short-peduncled small racemes, the females in very loose racemes; perianth-segments narrow, little enlarging and embracing only the base of the achene.*

All parts glabrous or nearly so; fruiting perianth-segments smooth . . . . . *S. Zeylanica.*

* * * *Male flowers in sessile bracted-involucred clusters, the females solitary, on slender peduncles; perianth-segments leafy, much longer than the achene and involucre-like*

All parts glabrous . . . . . *S. taxoides.*
Spines and young shoots puberulous; leaves 1-1½ in. long . . *S. microphylla.*

1. **S. aspera,** Lour.; Bedd. Sylv. Madr., 221, t. 26, f. 1; Brand. For. Fl., 410.—*Op-nai.*—An evergreen tree (30—40 + 4—10 + 2½—3), often forming in arid plains low, dense, intricately branched, minutely leaved copses, all parts harshly pubescent; bark ½ in. thick; cut milky; leaves somewhat rhomboid-oblong to obovate-oblong, on a pubescent petiole hardly a line long, rounded or obtuse at the narrowed base, usually 2-3 in. long, bluntish to blunt-acuminate, with a mucro, more or less repand-toothed, chartaceous, especially beneath harshly and shortly pubescent; flower-heads often androgynous, the male and androgynous ones on very short scabrous-pubescent peduncles solitary or by pairs, the female flowers solitary and on longer slender peduncles, usually clustered in the axils of the leaves; ripe achenes the size of a small pea, almost entirely enclosed by the fleshy orange-coloured roughish puberulous perianth-segments from which only the 2-cleft style protrudes.

Hab.—Frequent in the mixed and tropical forests along choungs, but chiefly in the savannah forests, all over Burma and adjacent provinces, also Andamans, up to 2,000 ft. elevation.—Fl. C.S.; Fr. H.S.—l.—SS.= ∞ *All.*

Remarks.—Wood red-brown, coarse, yields a white resin.

2. **S. mitis,** Kz.—An evergreen tree, apparently unarmed, all parts glabrous, or the shoots slightly appressed-pubescent; leaves resembling those of the preceding species but much larger and smooth, oblong to obovate-oblong, rounded at the base, on a slender petiole only 1½-2 lin. long, rather abruptly and bluntish acuminate, shallowly and remotely crenate-repand, membranous, 2-4 in. long, glabrous and smooth; male flowers in dense short-peduncled or almost sessile glabrous single or branched spikes of ½-1 in. length, arising singly from the axils of the leaves.

Hab.—Ava, Kakhyen hills.

3. **S. Zeylanica** (*Diplocos Zeylanica,* Bur.; *Taxotrophis Zeylanica,* Thw.; Bedd. Sylv. Madr., 222, t. 26, f. 3).—An evergreen small tree, 12-18 ft. high, or shrub, usually armed with long, straight, sharp spines (abortive branchlets), all parts glabrous or the young shoots puberulous; leaves from rhomboid-oblong to oblong- and rhomboid-lanceolate, on hardly a line long petiole, long but blunt acuminate, rounded or acute at the base, 3-4 in. long, serrate, thin-chartaceous, glabrous; male flowers shortly pedicelled, in loose, short-peduncled, small, puberulous racemes, axillary, by

pairs, the female, flowers long-pedicelled, forming a lax, glabrous poor raceme in the axils of the leaves; achenes the size of a small pea, only at the base surrounded by the lanceolate somewhat enlarged and carnescent smooth perianth-segments.

HAB.—Burma.

4. **S. taxoides,** Kz.—An evergreen small tree, 15-25 ft. high, armed with woody, straight, sharp spines, all parts glabrous; leaves obovate-cuneate to cuneate-lanceolate, on a glabrous petiole 1-2 lin. long, rounded at the narrowed base, acuminate, 2-4 in. long, irregularly and remotely serrate, thin-chartaceous, glabrous; the male flowers in sessile, paired, axillary clusters with a short many-bracted involucre; the females on very slender peduncles with a pair of small bracts at or below its middle, usually solitary or by pairs in the axils of the leaves; perianth-segments leafy; achenes covered by the leafy, involucre-shaped, lanceolate, acuminate perianth-segments of about ¾ in. in length.

Var. (?) 2, **microphylla** (*Streblus microphylla,* Kz.): the young shoots puberulous, the spines puberulous and leaf-bearing; leaves 1-1½ in. long, ovate to oval, blunt, with a mucro, remotely roundish crenate; fl. and fr. unknown.—A small straggling tree.

HAB.—Var. 1: along the rocky coasts of the Andamans, in tropical forests; var. 2: common in the swamp forests of the Irrawaddi alluvium.—Fl. May.—s.

BALANOSTREBLUS, Kz.

Flowers monoecious, the males apparently in catkins, females racemose. Perianth connate with the ovary, free upwards, but entirely enclosing the ovary, perforate at the apex. Ovary half-superior, with a solitary pendulous ovule; style short, protruding from the perianth-mouth; stigmas 2, short, thick, villous. Seed enclosed in the fleshy perianth and drupaceous.—Milky trees, with alternate spiny-toothed leaves. Inflorescences axillary.

1. **B. ilicifolia,** Kz.—An evergreen small tree, the branchlets shortly pubescent and rough; leaves elliptical to broadly oval, on a glabrous terete petiole about 1-2 lin. long, often somewhat unequal at the acute or obtuse base, rigidly coriaceous, spiny-acute, coarsely spiny-toothed, 1-3 in. long, glabrous, the lateral nerves rather crowded, straight and anastomosing; flowers too young, but apparently forming short, sessile, dense, glabrous spikes in the axils of the leaves, with apparently distichous, broad, rounded, ciliolate bracts; drupes the size of a pea, red, tubercled-wrinkled, glabrous.

HAB.—Chittagong and Ava.

MALAISIA, Lour.

Flowers dioecious, the males in one-sided dense spikes, the females packed on globular receptacles. Males: perianth 3- or 4-cleft, the segments almost valvate in bud. Stamens as many as perianth-segments and opposite to them, incurved in the bud; filaments filiform, elastically reflexed with opening of the flower. Females: perianth urceolate, with an opening at the apex. Ovary sessile, enclosed, with a solitary pendulous ovule; style short, the 2 stigmas elongate. Achenes berry-like, enveloped by the enlarged perianth. Albumen none. Embryo with fleshy cotyledons, the radicle superior.—Unarmed scandent shrubs, with entire or toothed leaves. Male receptacles elongate, bearing the flowers only on the upper side, beneath naked, shortly peduncled and usually several together, forming a cluster (reduced raceme) or rarely solitary or by pairs in the axils of the leaves; female spikes more or less globular, peduncled, arising singly from axillary shoots and appearing as if racemose.

1. **M. tortuosa,** Blanco.—A leaf-shedding large scandent shrub, with terete grey stems, all parts glabrous or the young shoots minutely and sparingly pubescent; leaves elliptically- to ovate-oblong, on a glabrous or nearly glabrous petiole 3-4 lin. long, rounded or almost cordate at the base, acuminate, 4-5 in. long, thin-chartaceous, more or less repand-toothed, glabrous or minutely puberulous along the nerves beneath; male spikes 1-1½ in. long, densely greyish puberulous, on shortly greyish tomentose 3-4 lin. long peduncles, clustered or almost racemose in the axils of the leaves or more usually above the scars of the fallen ones; the female spikes globular, the size of a pea, on puberulous rather stiff 3-4 lin. long peduncles arising singly from above the scars of the fallen leaves of the first year's axillary shoots, and hence appearing racemose; styles very long, filiform and puberulous; achenes ovoid, about a line in diameter, usually 2 or 3 coming in perfection on the same head and enclosed in the enlarged fleshy perianths.

Hab.—Not unfrequent in the tropical forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim.—Fl. Feb.-March; Fr. Apr.-May.—s : l.—SS.=SiS. Metam., etc.

BROUSSONETIA, Vent.

Flowers dioecious, the males in dense, bracted, elongate spikes, the females in globular heads. Males: perianth 4-parted, the segments valvate in bud. Stamens 4, opposite to the perianth-segments; filaments long and exserted. Females intermixed with

numerous scales (abortive flowers); perianth urceolate or bell-shaped, 4- or 3-toothed at the apex, persistent. Ovary stalked, with a solitary pendulous ovule; style lateral, filiform, persistent. Berry elongate-club-shaped, supported by the perianth, with a sappy pericarp enclosing the seed at its thickened upper end, longer than the numerous pubescent bracts of the flower-head. Testa thin, membranous. Albumen scanty. Embryo with oblong cotyledons, the radicle superior.—Trees or shrubs abounding in milky juice, with simple or lobed serrulate leaves. Inflorescences axillary.

1. **B. papyrifera,** Vent.—*Ma-laing.*—An evergreen (?) shrub or small tree, 20-30 ft. high, with spreading pubescent branchlets, the young shoots softly tomentose-pubescent; leaves from obliquely ovate to trapezoid-oblong, undivided or often sinuately and deeply 2- or 3-lobed, on a pubescent glabrescent petiole 2-3 in. long, obtuse at the one side of the base, rounded or almost cordate at the other, 3-8 in. long, acuminate, serrulate-toothed, membranous, above very rough from a short tomentum, beneath softly and densely (often greyish) pubescent; the male spikes cylindrical, 2-3 in. long, on pubescent $\frac{1}{2}$-$\frac{3}{4}$ in. long peduncles, axillary, the female heads globular, tomentose, in fruit about the size of a cherry, on somewhat longer pubescent peduncles, solitary in the axils of the leaves; drupes sappy, glossy red.

Hab.—Martaban and Ava hills.

Remarks.—The fibrous bark is made into a kind of cloth, from which the palabeiks of the Karens are made. The inner bark is used in China and Japan for the manufacture of a kind of paper.

MORUS, L.

Flowers monoecious or dioecious, in dense spikes. Males: perianth 4- or rarely 5-parted, the segments in 2 series, imbricate in the bud. Stamens 4, or rarely 5. Ovary rudimentary. Females: perianth 4-parted, the outer segments larger. Ovary 2-celled (the one cell somewhat smaller), with a solitary pendulous ovule in each cell; stigmas 2, elongate-filiform. Achenes usually covered by the fleshy perianth and hence berry-like. Seeds albuminous. Embryo uncinnate with oblong cotyledons, the radicle rather long, superior.—Trees or shrubs, with alternate, entire, serrate or lobed leaves. Flowers in axillary spikes, the male ones elongate, the female ones shorter.

Female and male spikes 4-5 in. long	*M. lævigata.*
Male spikes about $\frac{1}{2}$ in. long	*M. Indica.*

1. **M. lævigata,** Wall.; Brand. For. Fl. 409.—*Ma-lain-pen.*—A tree, the young shoots pilose; leaves ovate to broadly ovate, undivided or occasionally lobed, rounded or cordate at the base, on

a pubescent petiole about an inch long, serrate-toothed, acuminate, membranous, while young sparingly or densely pubescent, soon turning quite glabrous, 3-4 in. long and often almost as broad; stipules linear-subulate, pubescent; male spikes slender, 4-5 in. long, villous, on rather short pubescent peduncles arising from the axils of the leaves of the first year's shoots; female spikes as long as the males and very similar to them, but the flowers more crowded and glabrous or nearly so; achenes enclosed in the little enlarged insipid whitish perianths.

Hab.—Martaban and Tenasserim hills, in tropical forests.—Fl. March.

2. **M. Indica,** L.; Brand. For. Fl. 408.—*Po-sa.*—A tree (30—35 + (?) + 2—2½), but usually kept down as a meagre simple shrub, probably leaf-shedding, all parts glabrous, or the very young shoots sparingly pubescent; leaves ovate, on a minutely pubescent glabrescent petiole about ½ in. long, rounded at the base, acuminate, 1½-3 in. long, coarsely and unequally serrate; stipules lanceolate, sparingly pubescent on the back; male spikes on filiform puberulous peduncles 2-3 lin. long, only about ½ an in. long, rather laxly flowered, axillary, arising from the young shoots; female spikes similar but much shorter, close-flowered; perianths glabrous or slightly and minutely pubescent; fruits compound, oblong or nearly so, 3-4 lin. long, consisting of smooth, purplish black, fleshy perianths enclosing the achenes.

Hab.—Nowhere really wild in Burma, but generally cultivated by the natives (especially the Karens) for food for silk-worms. Occasionally springing up in deserted toungyas or along the banks of mountain streams.—Fl. C.S.

TREMA, Lour.

Flowers dioecious or polygamous. Perianth 4- or 5-parted, imbricate in the bud, persistent. Males: stamens 4 or 5, opposite to the perianth-segments; filaments incurved. Ovary rudimentary. Females: ovary 1-celled, with a single ovule attached to the summit of the wall; stigmas 2, elongate-filiform, free or sometimes united at the base, persistent. Drupe fleshy or sappy, truncate or crowned by the stigmas, containing a hard putamen.—Trees, with penninerved, entire or serrulate leaves. Male flowers clustered-cymose or spicate, the females cymose or in spikes.

More or less pubescent; leaves serrulate	*T. orientalis.*
Minutely puberulous; leaves serrulate	*T. Timorensis.*

1. **T. orientalis,** Bl. (*Sponia orientalis,* Planch.; Brand. For. Fl. 430.)—*Sap-sha-pen.*—An evergreen tree (25—30+10—12+1½—2½), the branchlets more or less pubescent to almost villous; leaves more or less obliquely ovate to oblong-lanceolate and oblong, on a 2-3 lin. long petiole, at the base rounded or the one side cordate, 3-

5 in. long, acuminate, serrulate, chartaceous, above more or less retrorsely scabrous from stiff appressed bristles, beneath silvery appressed-pubescent or villous-pubescent, more or less 3-7-nerved at the base and penninerved upwards; flowers dioecious or polygamous, sessile or nearly so, forming short pubescent or villous cymes in the axils of the leaves and somewhat longer or shorter than the petiole; perianth-segments glabrous or nearly so, ciliate; drupes ovate, about a line long, sessile and supported by the perianth, glabrous, crowned by the reflexed stigmas.

Var. 1, **orientalis proper** (*Sponia Wightii*, Planch.; Bedd. Sylv. Madr., t. 311): branchlets minutely appressed-pubescent; leaves less rough above, beneath covered with a minute, appressed, silvery pubescence; cymes shortly and minutely pubescent.

Var. 2, **Amboinensis** (*Trema Amboinensis*, Bl.; *Sponia velutina*, Planch.; Bedd. Sylv. Madr., 219); branchlets more or less villous; leaves above very scabrous from numerous bristles, beneath covered with a silky or silvery, sometimes brownish villous pubescence.

Hab.—Var. 1: in Chittagong; var. 2: frequent in the tropical forests all over Burma and adjacent provinces, especially along river banks, etc., and profusely springing up in deserted toungyas.—Fl. Fr. ∞.—1.—SS.=SiS. Metam., etc.

2. **T. Timorensis**, Bl.—An evergreen small tree, all parts glabrous or the young branchlets minutely puberulous; leaves lanceolate to ovate-lanceolate, rounded or obtuse at the base, on a slender minutely pubescent glabrescent petiole about 3 lin. long, 2-3 in. long, membranous, serrulate, glabrous, yellowish-green, penninerved with a 3-nerved base, the nerves very thin; flowers sessile or nearly so, forming small minutely pubescent glabrescent cymes in the axils of the leaves; perianth glabrous; drupes about ½ a line long, broadly ovate, compressed, smooth, crowned by the styles.

Hab.—Tenasserim.

GIRONNIERA, Gaud.

Characters of the preceding genus, but the drupes much larger, the female flowers in racemes or cymes, or sometimes solitary and axillary.

* *Female flowers in cymes; drupes more or less compressed.*

Leaves pubescent beneath; stigmatic styles sessile . . . *G. nervosa.*

* * *Female flowers usually solitary, on a longer or shorter axillary peduncle.*

Leaves 5-8 in. long, very glossy and almost polished . . . *G. lucida.*

Leaves 3-4 in. long, opaque on both sides, serrulate . . . *G. cuspidata.*

1. **G. nervosa**, Planch.—An evergreen tree (30—40+10—15+4—5), the branchlets densely tawny-pubescent; leaves oblong

to elliptically oblong, unequal at the acute or obtuse base, on a strong densely pubescent petiole 3-4 lin. long, shortly and sometimes rather abruptly acuminate, rigidly chartaceous, entire, above somewhat wrinkled and on the midrib pubescent, beneath, especially on the nerves, pubescent; flowers sessile or nearly so, in small clusters, forming a slender pilose cyme in the axils of the leaves and very much shorter than them; drupes sessile or nearly so, spicate, supported by the perianth, the size of a pea, ovate or almost orbicular, compressed, minutely appressed-hispid, the pericarp rather dry, crowned by the long filiform sessile stigmatic styles or their bases.

Var. 1, **nervosa proper**: leaves more pilose-pubescent beneath; stigmas at the base united in a shorter or longer style.

Var. 2, **subæqualis** (*G. subæqualis*, Planch.; Bedd. Sylv. Mad., 219): less pubescent; stigmatic styles usually (not always) almost sessile; the drupes sessile or nearly so.

Hab.—Var. 1: Burma, probably Tenasserim; var. 2: in the tropical forests of Martaban.—Fr. March—s.

2. **G. lucida**, Kz.—An evergreen tree (30—40 + 10—15 + 3—4), all parts glabrous; leaves elliptical to oblong, on a glabrous petiole about ½ an in. long, obtuse or acute at the somewhat unequal base, shortly acuminate, 5-8 in. long, entire, chartaceous, quite glabrous, very glossy on both sides and the adult ones almost polished beneath (the younger net-veined like *G. cuspidata*), the lateral nerves impressed on the upper surface; drupes on a glabrous ½ in. long peduncle, solitary in the axils of the leaves, supported by the glabrous perianth, ovate to ovoid, the size of a small cherry, stylose-acuminate, quite glabrous.

Hab.—In the tropical forests of South Andaman.—Fr. May.—s.—SS.= Metam.

3. **G. cuspidata**, Planch. (*Galumpita cuspidata*, Bl.; *G. reticulata*, Thw.; Bedd. Sylv. Madr., t. 313).—An evergreen tree (30—40 + 10—15 + 3—4), all parts quite glabrous or the young shoots sparingly appressed-pilose; leaves ovate to ovate-oblong, on a glabrous petiole 2-3 lin. long, acute or rounded at the base, 3-5 in. long, bluntish acuminate with a mucro, thin-chartaceous, entire, opaque, thinly but very conspicuously net-veined on both sides; male flowers in small glabrous panicles on the axils of the leaves, the female ones solitary, long-peduncled, axillary; drupes ovoid, the size of a very small cherry, subtended by the perianth, acuminate and crowned by the styles or their bases, glabrous.

Hab.—Tropical forests of the eastern slopes of the Pegu Yomah, rare.—Fr. Apr.-May.—s.

SOLENOSTIGMA, Endl.

Flowers polygamous. Males: perianth 5-parted. Stamens 5, opposite the perianth-segments. Ovary rudimentary. Females: perianth as in the males but imbricate in the bud, deciduous. Stigmas dilated-notched or 2-lobed at the apex, persistent. Fruit a drupe. Albumen scanty; cotyledons folded.—Evergreen trees, with 3-nerved entire leaves. Flowers in panicles or cymes.

1. **S. Wightii**, Bl., (*Celtis Wightii*, Planch.; Bedd. Sylv. Madr., 218).—An evergreen tree (30—40 + 10—20 + 2½—3), all parts glabrous or the young shoots puberulous; leaves oblong to elliptically lanceolate, on a glabrous petiole 3-4 lin. long, rounded or acute at the base, bluntish acuminate, entire (or while young occasionally remotely serrate), chartaceous, 4-6 in. long, quite glabrous and green, 3-nerved, the 2 lateral nerves excurrent to the very point or confluent with the upper lateral nerves, with a thin but prominent net-veination between; flowers yellowish, almost sessile or shortly pedicelled, forming peduncled, often 2-cleft, slightly and minutely pubescent cymes in the axils of the leaves of the young shoots; drupes ovate, glabrous, the size of a pea, terminated by the dilated short styles.

Hab.—Tropical forests of the Andamans.—Fr. Apr.-May.—s.—SS.= Metam.

CELTIS, Tournef.

Flowers polygamous, dimorphous, the hermaphrodites only fertile. Males: perianth 4-5-parted, the segments concave, imbricate in the bud. Stamens as many as perianth-segments, hypogynous; filaments usually spreading elastically. Ovary rudimentary, surrounded by the villous disk. Hermaphrodites: perianth deciduous. Stamens as in males. Ovary seated on a villous disk; stigmas 2, sessile, or connate at the base, deciduous, filiform or linear-complanate. Drupe fleshy, ovate to ovoid.—Trees or shrubs, with 3-nerved leaves. Flowers in cymes or racemes, arising from the axils of the young leaves.

* *Fruiting peduncles solitary or by 2-3 from the leaf-axils, simple.*

Leaves tomentose (especially beneath), entire; fruiting peduncles solitary in the leaf-axils . . . . . *C. mollis.*

Leaves glabrous, serrate, green on both sides; fruiting peduncles solitary or by 2-3 from the leaf-axils . . . . . *C. Hamiltonii.*

As preceding, but crenatures more rounded, the leaves brownish beneath, larger . . . . . *C. tetrandra.*

* * *Fruiting peduncles branched.*

Leaves glabrous, remote serrulate; fruiting peduncles forming a tomentose, loose poor cyme in the axils of the leaves . *C. cinnamomea.*

1. **C. mollis,** Wall.—A tree, the branchlets terete, softly brownish or yellowish pubescent; leaves obliquely ovate, the one side of the base rounded, the other acute, on a strong densely tomentose petiole about 2 lin. long, $2\frac{1}{2}$-3 in. long, shortly and bluntish acuminate, membranous, entire, above shortly pubescent, beneath velvety-tomentose, 3-nerved at the base and penninerved; drupes on 4-6 lin. long densely brownish pubescent peduncles, solitary in the axils of the leaves, almost globular, acute at both ends, the size of a pea, sparingly hairy, the putamen wrinkled.

Hab.—Ava, in the Irrawaddi valley.—Fr. Sept.-Nov.

2. **C. Hamiltonii,** Planch.—A tree, the branchlets tawny-pubescent; leaves obliquely ovate to almost broadly falcate-lanceolate, acute at the unequal base, or the one side rounded, on a glabrescent petiole about 2 lin. long, almost caudate-acuminate, serrate from below the first half, chartaceous, glabrous, 3-nerved, with prominent net-veination between, yellowish green beneath, dark green and glossy above; peduncles solitary or by 2 or 3 in the axils of the leaves, about $\frac{1}{2}$ an in. long, stiff and glabrous; drupes ellipsoid, the size of a small pea, glabrous.

Hab.—Ava; Tenasserim, along choungs.—Fr. Apr.-May.

3. **C. tetrandra,** Roxb.—A tree, the branchlets pubescent; leaves obliquely ovate- lanceolate to lanceolate, on a 3-6 lin. long petiole, unequally cordate at the entire base, obtusely serrate, chartaceous, glabrous, brownish beneath; peduncles solitary or rarely by 2-3 in the axils of the leaves, about $\frac{1}{3}$-$\frac{1}{2}$ in. long, stiff, glabrous; drupes ovoid-globular, the size of a very small pea, glabrous; flowers 4-merous; stamens 4.

Hab.—Ava hills.—Fr. May.

4. **C. cinnamomea,** Ldl.—An evergreen tree (30—40+15—18+$2\frac{1}{2}$—3), the young branchlets softly and shortly tawny pubescent; leaves obliquely ovate, on a glabrescent 3-4 lin. long petiole, rounded at the base, long-acuminate, $3\frac{1}{2}$-$4\frac{1}{2}$ in. long, remotely and sometimes obsoletely crenate-serrate, when young membranous and slightly pubescent along the nerves, adult chartaceous and quite glabrous, beneath brown-variegated, 3-nerved, the net-veination lax and scarcely prominent; flowers 5-androus, the males in raceme-like puberulous short cymes, the hermaphrodites in shortly tomentose cymes, in the axils of the leaves; drupes in spreading tomentose racemes or cymes reduced in number to 2-6, long-peduncled, ovoid, the size of a pea, narrowed at the truncate apex, smooth.

Hab.—Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and of Martaban; also Chittagong.—Fr. Apr.-May.—s.—SS.=SiS. *Metam.*, etc.

ULMUS, Tournef.

Flowers hermaphrodite or polygamous, cymose. Perianth bell-shaped, 3-8-parted, marcescent or deciduous. Stamens as many or nearly twice as many as perianth-segments; filaments erect; anthers small. Fruit a winged samara, 1- or occasionally 2-celled, with the second cell smaller and empty. Seed ovate, compressed, anatrop or nearly so. Embryo straight. Albumen none.—Trees or shrubs, with entire or serrate leaves. Flowers minute, in small cymes along the leafless branchlets.

Leaves entire; perianth-segments deciduous . . . . *U. integrifolia.*
Leaves serrulate; perianth bell-shaped, marcescent-persistent . *U. lancifolia.*

1. **U. integrifolia,** Roxb.; Bedd. Sylv. Madr., t. 310; Brand. For. Fl., 431.—*Myouk-seit.*—A tree (50—60 + 15—30 + 5—12), shedding leaves in H.S., the young shoots pubescent; bark about ½ in. thick, ash-grey, sprinkled with brown corky pustules; cut dry, greenish yellowish; leaves obovate-oblong to oblong, on a puberulous petiole 3-4 lin. long, rounded or nearly so at the often unequal base, 4-6 in. long, apiculate, chartaceous, entire, glabrous above, beneath more or less shortly puberulous; the male and female flowers usually on the same inflorescence and forming shortly pubescent short cymes above the scars of the fallen leaves; perianth 4-parted to the base, the segments deciduous; ovary long-stalked, shortly greyish tomentose; samara stalked, somewhat obliquely oblong or roundish, at the apex shortly 2-cleft and with a hooked point, nearly an inch long and broad, glabrous, the broad wing chartaceous and nerved.

Hab.—Not unfrequent along choungs in the dry forests of Prome, rather rare in the upper mixed forests of the eastern slopes of the Pegu Yomah and of Martaban, east of Tounghoo.—Fl. March; Fr. Apr.—l.—SS.=*CaS.*, Metam., etc.

Remarks.—Wood white or pale-coloured, turning pale brown, rather heavy, coarse-fibrous, but rather close-grained, strong, takes fine polish, the sap-wood soon attacked by xylophages. Good for carts, etc.

2. **U. lancifolia,** Roxb.—*Tha-lai.*—A tree (70—80 + 40—50 + 6—8), usually shedding leaves at the beginning of H.S., the young branchlets and shoots puberulous; leaves obliquely lanceolate to ovate-lanceolate, on a strong pubescent petiole 1-2 lin. long, acute at the one side of the base and rounded at the other, 1-3 in. long, bluntish acuminate, elegantly serrulate, while young thin-chartaceous, with thin nervature, adult rigidly chartaceous, with the nerves and net-veination prominent beneath; flowers hermaphrodite, on puberulous pedicels up to ½ in. long, forming a shortened

raceme in the axils of the young leaves or above the scars of the old fallen ones; perianth bell-shaped, 5-cleft, glabrous; ovary glabrous, slenderly stalked; samara obliquely obovate to oblong, stalked, about an inch long, shortly 2-cleft at the apex and the lobes uncinnate, the broad wings thin-chartaceous, nerved.

Hab.—Not unfrequent in tropical forests of the Pegu Yomah and along choungs in the dry forests of Prome.—Fl. Jan.-Feb.; Fr. March.—s : l.

Remarks.—Wood red-coloured, strong. Adapted for house-building.

AMENTACEÆ.

Flowers small, unisexual, in cylindrical, oblong, or globular catkins, usually covered with densely packed scale-like bracts, rarely with loose or with minute deciduous scales. Stamens in males 2 or more (rarely united into 1) under each scale, usually accompanied by 2 or more smaller scales, either distinct or forming sometimes an irregular or oblique perianth of 5 or 6 segments, or rarely entirely deficient. Female catkins either like the males, with 1, 2, or 3 flowers under each scale, or reduced to a sessile bud, with 2 or 3 flowers in the centre, surrounded by the lower empty scales of the catkin; under each scale are usually 2 or 3 inner scales. Perianth none, or closely combined with the ovary, with a free, entire or toothed, minute border. Ovary 1- or several-celled, with 2 or more styles always resulting in a 1-celled fruit, either drupaceous or dry, and if dry free and exserted or in various ways enclosed in the involucre. The catkin-scales or the inner scales, or both, usually persisting, and sometimes enlarged in an involucre, either more or less enclosing the fruit or forming a cup under the fruit. Albumen none.—Trees or shrubs, with simple alternate leaves. Stipules more or less peristent.

Not a very large order, but very important to the forester. It includes the oak, hazelnut, alder, birch, beech and chestnut. The timber of many is valuable, and the European and American oak-timber is too well known to require special reference. Several Indian oaks yield timber probably not much inferior to the European. Birches and alders have usually soft wood, but the North American black birch yields a very hard and most valuable timber. The bark is often astringent and bitter, and that of oaks is good for tanning, while that of the birches contains a balsamic oil, and a peculiar resinous substance called betuline or birch-camphor. Cork comes from *Q. suber*. Galls form chiefly on *Quercus infectoria*, but inferior ones are found also on some Indian oaks. Wax is obtained from the berries of *Myrica cerifera* and some other American species. The fruit of *Myrica Nagi* is edible.

* *Ovary* 1-*celled, with a solitary erect ovule; fruit drupaceous, covered with resinous secretions.*

Male and female catkins sessile, erect; scales of the male catkins broad, imbricate; anther longer than the filaments . . . *Myrica.*

** *Ovary* 2-*celled, with a solitary suspended ovule in each cell; nuts small, often winged,* 1-*celled, combined with the scales in a sort of cone.*

Scales of the male catkins stalked, those of the females deciduous. female catkins cylindrical, compact; nuts not connate with the involucre; anther-cells distinct . . . . . *Betula.*

Anther-cells more or less connate; scales of female catkin persistent . . . . . *Alnus.*

Scales of the catkins sessile; female catkins loose, spike-like; bracts solitary, each in a 3-lobed leafy involucre . . . *Carpinus.*

*** *Ovary* 3-9-*celled, with* 2 *suspended ovules in each cell, most of the ovules abortive; nuts solitary or several, rather large, bony or coriaceous, more or less enclosed in the enlarged wingless, dry, spiny, scaly or smooth involucre, or the involucre reduced to a scaly or annular cup, in which the solitary nut rests* (*acorns*).

Nuts solitary, resting on a scaled or lamellate-annular cup, exserted, or at least with a circular opening at the apex of the cup . *Quercus.*

Nuts solitary or by 2-3 wholly enclosed in the enlarged, spiny or zonate involucre . . . . . *Castanea.*

MYRICA, L.

Catkins axillary, usually arising from young shoots, simple or compound, and forming a spike or panicle. Male flowers with 2-16 stamens under each scale, sessile or spiked, naked or seated within 2 or more sterile bractlets. Filaments more or less connate at the base; anthers 2-celled, the cells dehiscing longitudinally. Female flowers with 2-4 bractlets. Ovary terminated by 2 lateral filiform sessile stigmas, 1-celled, with a solitary erect ovule. Fruit drupaceous, resinous, with a papillose or wrinkled pericarp, enclosing a more or less hard, bony, 1-seeded nut. Albumen none; cotyledons fleshy, convex.—Trees or shrubs, rarely undershrubs, with rigid simple leaves often serrulate or serrate. Stipules present.

1. **M. Nagi**, Thbg. (*Myrica sapida*, Wall.; Brand. For. Fl., 495).—An evergreen tree (30—40 + 8—15 + 3—4), the young branchlets more or less brown-tomentose or pubescent; leaves lanceolate, 4-6 in. long, bluntish or bluntish acuminate, at the cuneate base narrowed into the tomentose or puberulous petiole 3-4 lin. long, rigidly but thinly coriaceous, entire or slightly serrate, while young pubescent on the nerves beneath, soon glabrescent; male catkins small, cylindrical, remotely arranged along the slender puberulous rachis in a spike shorter than the leaves; female catkins much shorter and simply spicate; drupes compressed-oblong, the size of a small cherry, papillose, crimson, fleshy, resinous, the resin occasionally intermixed with short, brown, soft hairs.

Hab.—Common in the drier hill forests of Martaban, at 4,000 to 6,000 ft. elevation.—Fr. Apr.—l.—SS.=Metam.

BETULA, Tournef.

Flowers monoecious. Scales of the male catkins peltate, furnished at both sides with a bractlet, covering 3 flowers. Perianth 1-phyllous, scale-like and entire. Stamens 2, 2-cleft at the apex, the anthers 1-celled. Scales of the female catkins 3-lobed or rarely almost entire, imbricate, 2-3-flowered, turning membranous and often fallen off along with the fruits; ovary 2-celled, with a solitary pendulous ovule in each cell; stigmas 2, sessile, filiform. Nut lenticular, samaroid, compressed, surrounded by a membranous wing, 1-celled by abortion and 1-seeded, crowned by the 2 spreading stigmas.—Trees and shrubs, with toothed or serrate leaves. The male catkins arising singly or by pairs from the lateral and terminal buds, the female ones solitary or rarely in racemes from a lateral 3- to 5-leaved bud. Cones small, oblong to cylindrically linear.

1. **B. acuminata,** Wall.; Brand. For. Fl. 458, t. 56 (*B. cylindrostachya,* Wall.).—A tree leafless during C.S., the young parts pubescent; leaves ovate to elliptically ovate, on a slender pubescent petiole 2-3 lin. long, more or less acuminate, rounded at the base, $1\frac{1}{2}$-3 in. long, membranous, densely pubescent while young, adult more or less glabrescent, especially above; female and male catkins elongate, 1-2 in. long, the former usually on a short pubescent peduncle; flower hairy; wings much broader than the nut, and broader than the membranous bract.

Hab.—Rather rare in the drier hill forests of the Martaban hills east of Tounghoo, at 5,000 to 6,000 ft. elevation.—l.—SS.=Metam.

ALNUS, Tournef.

Flowers monoecious, in catkins. Male catkins: scales peltate, with 5 bractlets, 3- or rarely 1-flowered. Perianth usually 4-parted, or rarely irregularly 10-12-phyllous. Stamens as many as perianth-divisions and opposite to them; filaments very short; anthers 2-celled. Female catkins: scales imbricate, fleshy, with 4 appendages, 2-flowered. Cones short, the scales wedge-shaped, in front shortly 4-5-lobed, thickened upwards, more or less woody, persistent. Not compressed, winged or not, 1-celled by abortion, 1-seeded.—Trees or shrubs, with serrate or toothed leaves. Catkins usually in short racemes or solitary.

1. **A. Nepalensis,** Don.; Brand. For. Fl., 460.—A tree shedding leaves during C.S., all parts glabrous; leaves oblong to oblong-lanceolate and elliptical, on a rather slender petiole varying in length

from a few lines up to an inch, usually obtuse at the base, shortly acuminate or acute, 3-4 in. long, minutely serrate, chartaceous, glabrous, slightly glaucescent beneath; catkins sessile, in short racemes terminating the young terminal and lateral shoots, the male ones slender and 1-2½ in. long, the female ones very short and small, cylindrical; cones ovoid or almost oblong, shortly stalked, ½-1 in. long; wings of the nut membranous, narrow, often broader at the apex, somewhat irregular.

Hab.—Ava, Kakhyen hills.—Fl. Aug.; Fr. March.

CARPINUS, Tournef.

Male flowers consisting of 6-12 stamens gathered in the axil of ovate acute bracts. Filaments slender, not exserted; anthers 2-celled, the cells discret, pilose at the apex. Female flowers by pairs in the axil of caducous bracts, each concealed by an accrescent bractlet. Ovary many-nerved, shortly and unequally lobed at the apex, almost 2-celled with 2 placentas, from one of which arise the 2 pendulous ovules, while the other is sterile; style short; stigmas 2, linear. Nuts almost woody, many-nerved, 1-celled, with a solitary seed. Albumen none; cotyledons fleshy, plano-convex, covering the superior radicle.—Small trees or shrubs, with doubled-serrate leaves. Stipules deciduous. The male catkins lateral, the female spikes terminal.

1. **C. viminea,** Wall.; Brand. For. Fl., 492.—A tree probably leaf-shedding, about 30 to 40 ft. high, the young parts minutely puberulous or slightly and sparingly pubescent; leaves ovate to ovate-lanceolate, on a slender pubescent petiole 2-3 lin. long, acute or obtuse at the base, 3-5 in. long, long-acuminate, sharply and doubled-serrulate, chartaceous, the midrib beneath pubescent; the male catkins axillary, with ovate, acute, brown, glossy scales; the female spikes lax, terminal, with long linear scales; fruiting bracts falcately ovate-lanceolate, 3-4-nerved, with a few coarse teeth along the broader side, 9 lin. long; nuts about 2 lin. long, ovoid, acute, 7-8-nerved, resinous-dotted.

Hab.—Rather frequent in the drier hill forests of the Martaban hills east of Tounghoo, at 5,000 to 6,000 ft. elevation.—l.—SS.=Metam.

CASTANEA, Tournef.

Male flowers clustered and surrounded by bracts forming catkins. Perianth regularly 5- to 6-lobed. Stamens 10-15, but usually twice as many as perianth-lobes; filaments slender; anthers minute, 2-celled. Ovary rudimentary or none. Female flowers by 3 to 1 within a scaly involucre. Perianth 6-parted, the lobes blunt, in 2 rows. Ovary 3- to 6-celled, with 2 ovules in each cell;

styles 3, rarely 3 to 6, linear. Nuts by 3 to 1 enclosed in a more or less globular or oblong echinate or almost conically-tubercled or rarely zonate or smooth involucre which is indehiscent or irregularly bursting. Nuts usually 1-seeded by abortion. Cotyledons thick, plano-convex or waved-ruminate. Radicle superior.—Trees quite of the habit of the oaks and ill-separated from them, with entire toothed or serrate leaves.

* *Fruits armed with simple or compound sharp spines.*
† Leaves sharply serrate.
All softer parts and leaves beneath tawny tomentose . . . *C. Indica.*
†† Leaves entire, or remotely and obsoletely serrate towards apex.
○ Fruits more than an inch in diameter, the spines long and much crowded.
× Young shoots pubescent.
Spines of involucre straight and slender, glabrous; spikes robust, tomentose . . . . . *C. diversifolia.*
Spines of involucre curved and strong, tawny-pubescent; inflorescence sparingly pubescent . . . . . *C. Roxburghii.*
× × Quite glabrous.
Leaves beneath more or less silvery; male spikes robust and densely tawny-tomentose; spines of fruit simple and free . *C. argentea.*
Leaves beneath more or less tawny or somewhat metallic; male spikes very slender, greyish pubescent; spines of fruit clustered or connate at base . . . . . *C. Javanica.*
○ ○ Fruits less than an inch thick, usually the size of a cherry, the spines often recurved and distant.
Leaves entire, or remotely serrate towards apex, glabrous or minutely brownish tomentose beneath . . . . . *C. tribuloides.*
* * *Fruits armed with very short pointed or blunt cones, or deciduous tubercles, and at length turning unarmed and zonate.*
† The fruiting involucre of a very thick coriaceous texture.
Fruits armed with short cones; leaves uniformly green . . *C. rhamnifolia.*
Adult fruits unarmed, zonate, grey; leaves more or less silvery or coppery beneath . . . . . *C. inermis.*
†† Fruiting involucre of a very thin texture.
Fruits blackish, smooth, with 4 or 5 scared annular rings; leaves more or less silvery or coppery beneath . . . . . *C. lanceæfolia.*

1. **C. Indica,** Roxb. (*Castanopsis Indica,* D.C.; Brand. For. Fl., 490).—A small tree, about 25 to 30 ft. high, the young parts all tawny-tomentose; leaves oblong to elliptically oblong, on a tawny-pubescent petiole 3 to 5 lin. long, often unequal at the rounded base, 6 to 8 in. long, acuminate, bristly serrate, coriaceous, glossy above, beneath (especially on the nerves) shortly tawny-pubescent; the catkins rather stiff, erect, tawny-villous or tomentose, in short panicles in the axils of the leaves or more usually forming compound villous or tomentose panicles at the end of the branches; male perianth 6-parted, tawny-villous, the lobes elliptical; fruit-involucre spherical to obovate, about an inch in diameter, irregularly bursting when fully ripe, densely covered with spines, the spines nearly ½ an inch long, sparingly appressed-pubescent, thin, sharp, simple,

straight or slightly curved, clustered; nuts hard, somewhat hairy especially round the apex, generally 1-seeded, softly pubescent within.

HAB.—Chittagong.

2. **C. diversifolia,** Kz.—*Kyanya.*—An evergreen (?) tree (40—60 + 15—25 + 3—5), the young shoots more or less tawny-pubescent; leaves very variable according to age, the younger ones chartaceous, ovate-oblong to ovate, 7 to 9 in. long by 4-4½ broad, on a pubescent petiole ½ an inch long, slightly pubescent on the nerves on both sides, the nerves and lax net-veination strong and conspicuous; the full-grown leaves much smaller, coriaceous, elliptically oblong, shortly and bluntish acuminate, 4½ to 6 in. long, minutely puberulous on both sides or only the petiole and the nerves on both sides glabrescent, without silvery minute scales; panicles large and robust, crowded at the end of the branchlets, densely tawny- or greyish-pubescent; perianth thickly tomentose; fruit-involucre nearly 1½ in. in diameter, covered by spines, which are simple, stiff, sharp, about 4 lin. long, pubescent.

HAB.—Common in the drier hill forests of the Martaban hills east of Tounghoo, at 3,500 to 5,000 ft. elevation.—Fl. Apr.; Fr. the next year.—l.—SS.=Metam.

3. **C. argentea,** Bl.—An evergreen tree (50—60 + 20—25 + 9—10), all parts glabrous, the young branchlets usually somewhat pruinous; leaves ovate-oblong to elliptically lanceolate, 5-7 in. long, obtuse or acute at the base, more or less acuminate, on a glabrous petiole ½-1 in. long, chartaceous, entire, beneath almost silvery from a minute indistinct scaly tomentum, the lateral nerves thin but prominent, the veination very thin and rather obsolete; male spikes robust, interrupted, axillary and terminal at the end of the branchlets and forming more or less ample densely tawny-tomentose panicles; bracts obvate, acute, puberulous; perianth-lobes oval-oblong; fruit-involucre up to an inch and more in diameter, densely silky-velvety, 1-3-seeded, densely echinate, the spines simple and rather thick 3-4 lin. long, very sharp and variously but slightly curved, appressed silky-pubescent; nuts sparingly and fugaceously appressed-pubescent.

Var. 2. **Tungurrut** (*Castanea Tungurrut, Bl.*): hill form, lower and stunted, the spines of the fruit longer and much more slender.

HAB.—In the tropical forests above Rangoon and Tenasserim; var. 2: in the stunted hill forests of the Martaban hills east of Tounghoo, at 6,000 to 7,000 ft. elevation.—Fr. Apr.—SS.=Metam.

4. **C. Javanica,** Bl.—An evergreen tree (50—60 + 20—25 + 9—10), all parts glabrous; bark greyish brown, about ½ in. thick, brittle; cut reddish brown; leaves lanceolate to oblong-

lanceolate, acute or acuminate at the base, on a 3-4 lin. long petiole, shortly and rather abruptly acuminate, 5-6 in. long, entire, firmly chartaceous, glabrous, rather glossy above, beneath tawny or somewhat metallic from a minute, compact, indistinct tomentum, the lateral nerves rather prominent, the veination thin and inconspicuous; male spikes long and very slender, densely greyish puberulous, panicled in the axils of the leaves or forming larger terminal panicles; bracts broadly half-ovate, blunt; perianth-lobes oval, greyish pubescent outside; fruit-involucre densely and greyish silvery-velvety, globose, when fully ripe 1½-2 in. in diameter, spiny-armed, the spines fascicled from a more or less distinct tubercle and simple, up to ½ in. long, appressed silky-pubescent, very sharp and usually straight but variously divaricate.

Var. 2. **Falconeri** (*Castanopsis Falconeri*, Hance): spines of the more pubescent involucre less crowded, higher up connate and somewhat compressed, usually depressed from above.

Hab.—Frequent in the tropical forests, especially along choungs, of Pegu, Martaban, and Tenasserim: var. 2; Upper Tenasserim.—Fl. end of R.S.; Fr. end of H.S.—s.—SS.=Metam. SiS., etc.

Remarks.—Wood brown with silvery lustre, heavy, fibrous but close grained, strong.

5. **C. Roxburghii,** Lindl.—An evergreen large tree, the young shoots and linear acuminate stipules tawny-pubescent; leaves oblong to obovate-oblong, ½ to nearly a foot long by 3-5 in. broad, on a thick sparingly pubescent petiole about ½ in. long, nearly acute at the base, entire, shortly and bluntish acuminate, chartaceous, glossy and glabrous on both sides, the nervature thin but prominent, the net-veination close and elegant; female spikes solitary in the axils of the leaves, sparingly pubescent; the female perianth-lobes broad, blunt, pubescent; nuts ovate, a little hairy, completely hid in the globular fruit-involucre, the latter minutely tawny-pubescent, covered with numerous sharp, curved, tawny-pubescent, rather strong, branched spines of 2-3 lin. length.

Hab.—Chittagong.

6. **C. tribuloides,** Sm.; Brand. For. Fl., 490.—*Kyanza.*—An evergreen tree (40—50+20—25+3—4), the young branchlets glabrous or minutely velvety; bark an inch thick, dark grey, rough; cut brown, dry; leaves lanceolate to oblong-lanceolate, acuminate, on a glabrous petiole up to ½ an in. long, acute or acuminate at the base, more or less chartaceous or almost coriaceous, entire or slightly serrate towards the point, beneath minutely and compactly tomentose or minutely and indistinctly scaly or wholly glabrous, 3-5 in. long, the lateral nerves thin but conspicuous, the net-veination more or less lax and often indistinct; inflorescence greyish tomen-

tose ; bracts ovate, acute ; fruit ovate, globular, the size of a cherry, greyish-velvety, spiny-armed, the spines rather distant, short, simple or more usually clustered, often recurved, sharp, more or less appressed-pubescent.

Var. 1, **ferox** (*Quercus ferox, Roxb.*) : leaves much larger, glabrous on both sides, entire, the spines of the fruit longer and straight ; albumen equable.

Var. 2, **armata** (*Quercus armata, Roxb.*) : leaves smaller, often remotely serrate towards the apex, beneath often minutely and thinly tomentose ; albumen ruminate.

Hab.—Var. 1 : frequent in the drier hill forests of Martaban and Upper Tenasserim at 2,500 to 4,000 ft. elevation ; also Ava, Kakhyen hills.—l.—SS.= Metam.

Remarks.—Wood greyish, turning brown on exposure to air, rather heavy, of a coarse grain, bony-fibrous, brittle, soon attacked by xylophages.

7. **C. rhamnifolia,** Kz.—An evergreen tree (50—60 + 20—25 + 4—6), the younger branchlets puberulous but soon glabrescent ; leaves elliptically to oblong-lanceolate, somewhat unequal at the acute base, on a slender glabrous petiole up to ½ in. long, sharply or bluntish acuminate, entire, 4-6 in. long, chartaceous, while young sprinkled with a few appressed hairs on the midrib beneath, the lateral nerves rather numerous, thin and conspicuous, the net-veination rather lax and conspicuous ; inflorescence greyish tomentose ; perianth and the ovate bracts tomentose ; fruits unilaterally obovoid, 1½-2 in. long, greyish tomentose, strongly spiny-armed, the spines hardly 1½ lin. long, compressed-conical, simple, sharp, grey-tomentose ; nut large, wholly adnate to the involucre.

Hab.—Not unfrequent in the tropical forests along the eastern slopes of the Pegu Yomah and in South Tenasserim.—Fl. Jan. ; Fr. May.—s.—SS.=*Si.* Lat. p.

8. **C. inermis,** Lindl.—An evergreen tree (40—50 + (?) + 4—6), all parts glabrous, the branchlets often somewhat pruinous ; leaves very like those of *C. argentea,* elliptically to oblong-lanceolate, on a slender glabrous petiole ½ in. long or somewhat longer, acute at the base, 4-5 in. long, acute or shortly acuminate, thick-chartaceous, entire, glabrous, glossy above, minutely silvery tomentose beneath ; inflorescence shortly greyish tomentose ; fruits when fully ripe more than an inch in diameter, often by 2 or 3, confluent, irregularly obovate, while young greyish velvety, soon glabrescent, unarmed and zonate, the zones broad, concentric, longitudinally striate, while young bordered by minute tubercle-like bractlets.

Hab.—Rare in the moister hill forests of the Martaban hills east of Tounghoo, at 4,000 to 5,000 ft. elevation.—Fr. March.—s.—SS.=Metam.

9. **C. lanceæfolia** (*Quercus lanceæfolia*, Roxb.).—An evergreen very large tree, all parts glabrous; leaves lanceolate to oblong-lanceolate, acute at the base, on a glabrous petiole about ⅓ in. long, bluntish acuminate, entire, thick-chartaceous, 5-7 in. long, glabrous, glossy above, beneath indistinctly coppery-silvery, the nerves and veination thin; inflorescence as in *C. inermis*, tawny-tomentose; fruits with a very thin-walled involucre, obliquely oblong, about ⅔-¾ in. long, glabrous, even, zonate, the zones very broad and marked by their scared borders; nuts pubescent, solitary or sometimes by pairs.

Hab.—Chittagong.—Fl. Dec.; Fr. Oct.

Remarks.—Wood light-coloured, very durable.

QUERCUS, L.

Male flowers in catkins, usually supported by a deciduous bract. Perianth regularly or irregularly 4-7- (usually 5-6-) lobed. Stamens variable in number, usually twice as many as perianth-lobes; filaments slender, exserted; anthers 2-celled, usually glabrous. Ovary rudimentary, hairy, or none. Female flowers usually solitary, seated in a cup-shaped involucre, or sometimes few-flowered by confluence of several involucres. Perianth 3-8-(usually 6-) lobed, rarely obsoletely toothed. Ovary inferior, 1-celled upwards, 3-celled at the base, with 2 ovules in each cell; styles 3, rarely 4, thick and often ligulate or linear. Nut seated on, or half-immersed in, the enlarged scaly or zonate involucre (cup), rarely entirely enclosed. Seed solitary by abortion; cotyledons thick, often plano-convex or waved on the back, rarely sinuate-lobed; radicle superior.—Trees or rarely shrubs, with variously shaped simple or lobed leaves. Stipules deciduous. Male catkins pendulous or erect, the nuts ripening in the first or the second year.

* *The cup beset with more or less crowded imbricate scales, the scales sometimes becoming obsolete with ripening of the fruit and appearing as concentric thickened zones.*

× Scales linear or subulate, more or less spreading; cup velvety, brown or grey.

Leaves almost glabrous; cup almost wholly enclosing the nut, only at top with a circular opening . . . . . *Q. fenestrata.*

As former, but nut far exserted . . . . . *Q. acuminata.*

Leaves more or less pubescent beneath; nut exserted . . . *Q. lappacea.*

×× Scales broad and short, appressed to the cup.

○ Fruiting peduncle several inches long, the fruits numerous and more or less spicate; cups (usually greyish-) velvety; nut exserted.

† Leaves glabrous.

Shoots glabrous; cup about an inch in diameter, the borders often reflexed greyish velvety, indistinctly scaly; leaves acuminate at the base, rather slenderly petioled, the nerves prominent . *Q. Amherstiana.*

Similar to the preceding, but the cup rusty-velvety, distinctly appressed-scaly, the leaves rounded at the base, very short- and thick-petioled, the nerves immersed above . . . . . *Q. Falconeri.*
Shoots greyish puberulous; cup only about ½ in. in diameter; leaves rather opaque and somewhat glaucous . . . . *Q. polystachya.*
As former, but the reticulation and veination of leaves wanting . *Q. Bancana.*
Shoots greyish puberulous; cup about 5-8 lin. across; leaves glaucous beneath . . . . . *Q. Thomsoni.*
Shoots smooth; leaves glossy, one-coloured; cup about 5-8 lin. across; flowers in densely whitish tomentose appressed oblong clusters . . . . . *Q. spicata.*

† † Leaves pubescent beneath.

Cups usually connate, thickened-zonate, about ½ in. or less across; leaves coarsely and obsoletely repand towards apex . . *Q. Lindleyana.*

○ ○ Fruiting peduncle short, 1 rarely up to 2 in. long; cup wrinkled-rough, but glabrous, brown.

Cup obsoletely scaly-zonate, about 7-8 lin. across, almost resinous; leaves smooth, repand-serrate at apex . . . . . *Q. eumorpha.*

* * *Cup consisting of lamellate, entire, crenate or toothed, concentric rings; fruiting peduncle* 1-2 *in. long, rarely somewhat longer, usually few-fruited; leaves repand-serrate, at least towards apex.*

○ Nuts depressed, hardly exserted.

Cup about an inch in diameter, softly tawny or fulvous villous; petioles usually tawny or fulvous pubescent or villous, the nerves curved . . . . . *Q. velutina.*

○ ○ Nuts ovoid, exserted.

Cup about an inch across, softly tawny or fulvous villous; petioles smooth; leaves somewhat glaucous beneath, the nerves rather straight . . . . . *Q. semiserrata.*
Cup only ½ an in. across, greyish velvety; petioles slender, glabrous; leaves somewhat rugate, glaucous beneath . . . *Q. Brandisiana.*
Cup more than an inch wide and deep, greyish velvety; leaves smooth, one-coloured . . . . . *Q. mespilifolia*

* *The cup beset with more or less crowded scales (the scales sometimes becoming obsolete with ripening of the fruit and appearing as concentric thickened zones).*

1. **Q. fenestrata,** Roxb.—*Thit-kya.*—An evergreen large tree, the younger branchlets sparingly pubescent from fugaceous tawny hairs; leaves elliptically to oblong-lanceolate, on a glabrescent petiole hardly half an inch long, contracted and acuminate at the base, 5-6 in. long, acuminate, firmly coriaceous, entire, glabrous, beneath pale-coloured and often slightly appressed-pubescent on the midrib, the nerves thin and prominent, the net-veination thin and transverse; inflorescence greyish tomentose, the outer bract longest and lanceolate, acuminate; perianth velvety; nuts up to 7 lin. in diameter, in the first year laxly surrounded by a very scaly (scales up to 1½ lin. long, grey) involucre, the involucre brownish velvety, becoming very thin with ripening, and closing over the nut, leaving only a larger or smaller circular opening at the top, usually free, rarely with 2 abortive fruits adnate to its base, the scales

becoming remote, spreading, more or less linear, or sometimes partially obsolete.

HAB.—Hills of Upper Tenasserim.

2. **Q. acuminata,** Roxb.—A large tree, the young shoots somewhat villous; leaves oblong to broadly lanceolate, on a short petiole about ½ an in. long, 6-12 in. long, acuminate, glabrous; female spikes solitary, axillary, shorter than the leaves, villous; involucre large, hoary, imbricated upwards with acuminate scales; perianth minute, 5-toothed; nut ovate, smooth, brown, rather longer than the common acorn; cup saucer-shaped, echinate, with short projecting (spreading) sharp prickles, embracing about ¼ of the nut only.—(After Roxburgh.)

HAB.—Chittagong.—Fl. May; Fr. close of R.S.

3. **Q. lappacea,** Roxb.—An evergreen tree, the younger parts all tawny-tomentose; leaves elliptically to oblong-lanceolate, acute at the base, on a thick pubescent petiole about 2 lin. long, 5-7 in. long, acuminate, rigidly chartaceous, entire, while young membranous and wholly tawny-pubescent, when adult glabrescent above except on the midrib, the nerves and the transverse net-veination thin but distinct; inflorescence tawny-tomentose, the bracts minute, lanceolate, acuminate; perianth tomentose; nuts ovoid, silky-pubescent, the cup in the first year densely covered with imbricate soft tomentose scales, finally enclosing the nut ½ or ⅓ way up, brown, minutely velvety, the scales linear, more or less spreading, up to about 1½ lin. long.

HAB.—Tenasserim.

4. **Q. Amherstiana,** Wall.—An evergreen large tree, all parts glabrous; leaves elliptically to oblong lanceolate, on a rather slender glabrous petiole up to an in. long, more or less acuminate at the somewhat unequal base, 6-9 in. long, acuminate to bluntish apiculate, entire, thin coriaceous, glabrous, the nerves thin and prominent, the net-veination close and elegant; inflorescence greyish tomentose; bracts lanceolate, acuminate; perianth pubescent outside, the lobes blunt; anthers glabrous; nuts depressed-globular and in a young state slightly pubescent, when full-grown obovoid-globose, exserted, from 7-10 lin. in diameter, glabrous, the cups free or often by 2 or 3 connate at the base or more usually bearing 1 or 2 abortive ones at the base, concave and often somewhat reflexed on the margins, thick-coriaceous, greyish silky-velvety, covered with numerous small indistinct triangular scales.

HAB.—Upper Tenasserim; apparently frequent.—Fl. Feb.; Fr. March of the following year.

REMARKS.—Wood used for boat-building.

5. **Q. Falconeri,** Kz.—An evergreen tree, all parts glabrous; leaves resembling those of *Goniothalamus sesquipedalis,* elongate oblong, 1-1½ ft. long, acute at the base, on a thick glabrous petiole 3-4 lin. long, shortly acuminate or apiculate, thin-coriaceous, glossy on both sides, glabrous, the nerves numerous (about 20 on each side), impressed above, prominent beneath, the veination rather obsolete; fruiting spikes about 1½ ft. long, shortly tomentose; nuts obovoid-globular, nearly an inch in diameter, smooth (also when young), stylose-apiculate, pale-brown and glossy, exserted, the cups concave-explanate, with the borders more or less reflexed, thick-coriaceous, rusty-velvety, free or rarely at base connate, covered with numerous triangular appressed small scales, the inner side grey-silky.

Hab.—Upper Tenasserim.—Fr. March.

6. **Q. polystachya,** Wall.—An evergreen tree, the younger branchlets minutely puberulous; leaves ovate to oblong-lanceolate, narrowed at the base and somewhat decurrent on the glabrous petiole up to ⅔ in. long, acuminate, entire, thin coriaceous, beneath while young puberulous but soon quite glabrous and glaucous, the nerves thin but conspicuous, the net-veination rather obsolete; inflorescence greyish puberulous, panicled at the end of the branches, the bracts short, ovate, acute; perianth velvety outside; nuts globular, about ½ an in. in diameter, smooth, exserted, the cups small, only about 4 lin. in diameter and narrower than the thick robust fruiting rachis, explanate-concave, greyish velvety (especially outside), free or rarely the one or other of the abortive fruits adnate to their base, the scales densely imbricate, small, broad, mucronate, appressed and appearing rather indistinct.

Hab.—Ava hills.—Fl. Fr. Nov.

7. **Q. Bancana,** Scheff.—An evergreen (?) tree (25—30 + 10—15 + 1½—3), the trunk usually crooked, the young branchlets indistinctly and minutely appressed puberulous; leaves ovate to elliptically-lanceolate, on a ½-1 in. long petiole, acute at the base, bluntish or sharply caudate-acuminate, 3-4 in. long, entire, thin coriaceous, smooth and almost polished, glabrous, pale-coloured and without distinct net-veination beneath, the midrib somewhat prominent above and beneath (along with the lateral nerves) almost impressed, pale; flowers minute, sessile, forming shorter or longer puberous spikes, often arranged into greyish puberous larger or smaller panicles at the end of the branchlets; male flowers globular, nearly a line across, puberulous; perianth of the female flowers fully a line in diameter, appressed-scaly, puberulous and often sticky; ovary puberulous, terminating into 3 strong tawny-pubescent styles.

Hab.—Not unfrequent in the hill Eng forests and the drier hill-forests of the Martaban hills east of Tounghoo, at 3,000 to 5,000 ft. elevation.—Fl. March.—l.—SS.=Lat. Metam.

8. **Q. Thomsoni,** Miq.—An evergreen middling-sized tree, all parts glabrous; leaves from ovate-oblong and oblong to lanceolate, acuminate at both ends, on a petiole hardly $\frac{1}{2}$-$\frac{3}{4}$ in. long, 4-6 in. long, entire, glossy above, beneath pale-coloured, the nerves thin, with rather an obsolete transverse net-veination; inflorescence minutely greyish puberulous, the bracts minute; perianth whitish-tomentose; nuts up to 10 lin. in diameter, obovate-globular to ovoid-globular, exserted, covered with a thin minute very fugaceous greyish pubescence, the cups solitary or the abortive ones more or less adnate to the fertile ones, 5-8 lin. in diameter, expanded-concave, the sterile ones while young brown and sticky-glossy, with the numerous imbricate scales adnate, the fertile ones greyish velvety, with the broad small acute scales adnate or sometimes almost concentrically zonate.

Hab.—Chittagong.

9. **Q. spicata,** Sm.; Brand. For. Fl. 489.—*Thit-kya.*—An evergreen tree (30—60 + 10—30 + 4—5), all parts glabrous; leaves very variable, from oblong and elliptically oblong to obovate-oblong and even lanceolate, often narrowed towards the obtuse or acute base, on a smooth petiole 3-5 lin. long or almost sessile with a rounded or cordate base, 6 (in young shoots) 10-12 in. long, longer or shorter bluntish acuminate, entire, rigidly chartaceous, smooth and glossy, the nervature and net-veination conspicuous; inflorescence greyish tomentose, robust, the male flowers in elongate densely tomentose, appressed, small catkins, supported by a subulate, long, glabrous, deciduous bract; fruits more or less densely arranged along the strong straight rachis and more frequently united by 3-5 into clusters, rarely free or only the abortive cups adnate to the base of the fertile one; nut variable in size, exserted from the free cups, half-immersed in the connate ones, ovoid, smooth, the cups 5-8 lin. across, greyish-velvety, with thick, ovate-acute, imbricated scales which either turn more robust in a mature state or become (especially in the connate ones) confluent so as to form concentric scaly rings.

Hab.—Frequent in the drier hill-forests from Martaban down to Tenasserim; also Chittagong.—Fl. March-Apr.; Fr. the following year.—l.—SS.=Metam.

10. **Q. Lindleyana,** Wall.—An evergreen tree, the branchlets velvety-tomentose; leaves obovate-oblong, obtuse and somewhat unequal at the narrowed base, on a strong shortly pubescent petiole 4-5 lin. long, acute or very shortly and abruptly acuminate, 6-8 in. long, entire or waved towards the apex, thin-coriaceous, glab-

rous above, softly pubescent beneath, the nerves and the lax net-veination prominent; inflorescence apparently velvety-tomentose, the rachis in fruit very long and thick; fruits regularly connate by 2-5, rarely the one or other free; nuts ovoid, acute, 6-7 lin. long, smooth and glossy, exserted; cup concave, up to ½ an in. in diameter, tawny or greyish velvety-tomentose, the scales in young fruit rather indistinct, thick and appressed, at length becoming quite obsolete, and forming 4-5, somewhat swollen, entire or obsoletely scaly, concentric rings.

Hab.—Ava hills.

11. **Q. eumorpha,** Kz.—An evergreen tree (20—30 + (?) + 3—4) stunted, all parts glabrous; leaves ovate-oblong to oblong, sometimes unequal, at the base narrowed into a slender glabrous petiole 5-8 lin. long, shortly and bluntish acuminate, 3-4 in. long, coriaceous, slightly and bluntish serrate towards the apex, glabrous, uniformly green, the nerves thin, and, like the close net-veination, rather obsolete; fruiting peduncle only up to 2 in. long, apparently glabrous, bearing 1 or 2 fruits; nut ovoid, nearly 9-10 lin. long, smooth, exserted; cup 7-8 lin. in diameter, concave, thick-coriaceous, brown and glabrous, the scales while young tolerably distinct, 3-angular, acute, appressed, becoming more indistinct with ripening of the fruit, and arranged in concentric, narrow and unequal rings.

Hab.—Stunted hill forests of the top of Nattoung, in Martaban, at 6,000 to 7,000 ft. elevation.—Fr. March.—l.—SS.=Metam.

* * *Cup consisting of lamellate, entire, crenate or toothed concentric rings or zones.*

12. **Q. velutina,** Ldl.—A tree (40—60 + 15—20 + 4—5), shedding leaves in H.S., the young parts densely tawny- or brown-villous; leaves lanceolate to elliptically lanceolate, on a fulvous-villous somewhat glabrescent petiole about ½ in. long, 6-9 in. long, acuminate at both ends, rigidly chartaceous, serrate towards the apex, while very young densely villous-tomentose, at length glabrous and dark-green, the nerves curved, thin, and, like the rather lax net-veination, conspicuous; male catkins long and slender, tawny-villous; fruiting peduncles very short and thick, bearing only 1-3 fruits; nuts in the first year much depressed, yellowish or golden-villous with a short blunt knob bearing the short spreading stigmas, when fully ripe ovoid, glabrous, shorter than an inch, the cup very shallow (also in the perfect fruit), densely fulvous- or tawny-villous, with 6 or more lamellate, erose-toothed, concentric rings.

Hab.—Frequent in the Eng forests of the eastern slopes of the Pegu Yomah and from Martaban down to Tenasserim, rarely entering the tropical forests on laterite.—Fl. March-Apr.; Fr. the following year.—s.—SS.=Lat. p. Metam.

13. **Q. semiserrata,** Roxb.—*Thit-kya.*—An evergreen tree (40—50 + 15—20 + 3—4), the younger parts softly tawny or yellowish tomentose; bark rough, brittle, about ½ in. thick, peeling off in irregular oblong pieces, blackish grey; cut dry, red; leaves from lanceolate to oblong-lanceolate and oblong, acute to obtuse at the base, 5-9 in. long, acuminate, on a tawny or yellowish-velvety glabrescent petiole, rigidly chartaceous or thin-coriaceous, more or less repand-serrate towards the apex, while young densely greyish velvety, turning quite glabrous, somewhat glaucescent beneath, the nerves and rather lax net-veination thin but conspicuous; male catkins interrupted, slender and long, tawny-villous; fruiting peduncles very short and thick, bearing only 1-3 fruits; nuts depressed, with a long style, enclosed, when fully ripe ovoid, exserted, glabrous, about an inch long or somewhat longer; cup in the first year obversely turbinate and closed at the apex, tawny-villous, with 5-8 concentric, minutely toothed, lamellate rings, in the perfect ripe fruit deeply concave, embracing the base of the nut, less villous, or when very old appearing weathered.

Hab.—In the Eng forests of Ava, Pegu, and Martaban down to Tenasserim.—Fl. March-Apr.; Fr. the following year.—l.—SS.=Metam. Lat. Arg.

Remarks.—Wood □′ 48 pd. Used for plugs or pins to join together the three pieces that compose the body of a Burmese cart-wheel.

14. **Q. mespilifolia,** Wall.—An evergreen tree, the branchlets tawny-villous; leaves oblong to elongate-oblong, on a strong pubescent petiole ½-¾ in. long, obtuse at the base, 4-7 in. long, blunt or blunt-acuminate, coarsely and bluntish repand, coriaceous, glabrous or villous on the midrib beneath, glossy above, beneath paler and opaque, the lateral nerves rather numerous and stout, the transverse net-veination pretty conspicuous; inflorescence unknown; nuts when full-grown fully an inch in diameter, depressed-globose, hardly exserted, smooth and glossy; the cup 1-1¼ in. in diameter and nearly as deep, appressed-tawny-villous, hemispherical and tapering at the base, with 6-8, rather remote, irregularly crenate rings.

Hab.—Ava hill; also in the hills of Prome and on the Arracan Yomah, at 4,000 to 5,000 ft. elevation.

15. **Q. Brandisiana,** Kz.—*Thit-kya.*—An evergreen tree (35—40 + (?) + 3—4), the young branchlets greyish or tawny-pubescent; bark greyish or blackish, ⅓ in. thick, corky, longitudinally fissured; cut greenish; leaves oblong to obovate-oblong, sometimes unequal at the acute or obtuse base, 4-5 in. long, on a slender glabrous petiole 5-8 lin. long, shortly and bluntish acuminate, bluntish repand serrate, rather opaque on both sides, thin coriaceous, glabrous and wrinkled above, beneath glaucous and sprinkled with a fugaceous

down, the nerves straight, impressed on the upper side, strong, but thin on the under side, and, like the transverse veination, very conspicuous; fruiting peduncle about an inch long and few-fruited, or rarely up to 2½ in. long, tawny-tomentose; nuts while unripe depressed, and more or less enclosed, minutely appressed-puberulous, in ripening exserted, ovoid, glabrous; cups greyish velvety, concave, about ½ in. in diameter, consisting of about 5-6 erose, concentric, lamellate rings.

HAB.—Rather frequent in the hill Eng forests and drier hill forests of Martaban, at 1,000 to 4,000 ft. elevation.—Fr. March-April.—l.—SS.=Metam.

REMARKS.—Sapwood whitish.

16. **Q. xylocarpa,** Kz.—Fruits only known, which are connate, by 2-3 into irregularly obovoid clusters 1-2 in. in diameter. Nuts only at the apex free, the rest adnate to the woody corky involucre, depressed-globular, smooth; cups or involucres while young entirely enclosing the nut, finally opening circularly and exposing the apex of the nut, strongly and irregularly woody-muricate, glabrous, the tubercles (resp. scales) shortly conical, bluntish, about a line long, becoming smaller and obsolete towards the margin.

HAB.—Arracan, Yomah, east of Akyab, at 4,000 to 5,000 ft. elevation.

JUGLANDACEÆ.

Flowers unisexual, the males in axillary spikes or catkins, the females solitary or in terminal or axillary spikes or clusters. Males: perianth simple, irregularly 2-6-cleft, adnate to the entire or cut scale-like bracts. Stamens indefinite, sometimes 3 or more, in 2 or many rows; anthers sessile or nearly so, 2-celled, the cells opening longitudinally. Female flowers more or less connate with the bract or free; perianth double or simple; if double, the outer one more or less connate with the ovary, cup-shaped, 3- or more-toothed at the apex, or forming a bracted involucre, the inner perianth connate with the ovary, 4-toothed; if simple, forming a 4-toothed cup. Ovary inferior, 1-celled (or 2- or 4-celled at the base), with a solitary, erect or pendulous ovule in each cell; style short; stigmas usually 2, rarely 4. Fruit a drupe, with a fleshy or membranous pericarp (the enlarged perianth) indehiscent or dehiscing irregularly or in 4 valves. Nut consisting of the indurated ovary, bony, usually free from the pericarp. Testa membranous; albumen none; cotyledons fleshy, with a superior radicle.—Trees, with unpaired or rarely spuriously abruptly pinnate leaves; stipules none.

A small order, of which only a few species occur also in Burma. The timber of all the members of this family is valuable. The bark

is acrid and often astringent. The seeds of the common walnut is a favoured dessert.

Fruit a large drupe with a fleshy pericarp . . . . . *Juglans.*
Drupe small, dry, adnate to the enlarged, wing-shaped, 3-lobed bract . . . . . *Engelhardtia.*

JUGLANS, L.

Male catkins: perianth 5-6-lobed, adnate to the inner side of the bract. Stamens inserted on the torus in 2 or many rows; filaments very short, free; anthers 2-celled. Ovary-rudiment very rarely present. Female spikes short, terminal, few-flowered. Perianth double, connate with the ovary up to the style, the outer one cup-shaped, villous, at the apex 3- or irregularly many-toothed; the inner one 4-toothed; style short, with 2 linear-cuneate deciduous stigmas. Pericarp fleshy, indehiscent, connate with the nut, or irregularly bursting when overripe. Nut more or less globular, often irregularly wrinkled and pitted.—Trees, with deciduous unpaired-pinnate leaves.

1. **J. regia,** L.; Brand. For. Fl. 497.—A leaf-shedding large tree, the very young shoots velvety or floccose-pubescent; leaves glabrous, unpaired-pinnate, the leaflets in 5-6 pairs, ovate or ovate-lanceolate, somewhat unequal, almost sessile, membranous or nearly coriaceous, acuminate, 6-8 in. long, entire, glabrous, pilose in the nerve-axils beneath; male flowers sessile, the bract lanceolate; perianth elongated, 6-lobed; stamens usually 12, as long as the perianth-lobes; female spikes 2-5-flowered, the flowers sessile, the outer perianth villous, 3-toothed at the apex, the inner one glabrous and 4-toothed; drupes about 1-1½ in. long, elliptically oblong, with a glabrous pericarp, the nut ovoid, acuminate, deeply and roundedly wrinkled and pitted.

Hab.—Ava hills.—Fr. June-Aug.

Remarks.—Wood of young trees white and comparatively soft, that of full-grown trees compact, dark brown, beautifully veined and shaded with light-brown and black. Good for cabinet-making, gun-stocks, etc.

Note.—In the Shan States east of Ava grows another species of *Juglans* with smaller, almost globose, *quite smooth* nuts, but nothing is known about the tree itself.

ENGELHARDTIA, Lesch.

Flowers monoecious, in unisexual or androgynous simple or panicled spikes. Male flowers usually sessile or nearly so; perianth unequally 3-6-cleft, on a 3-lobed bract. Stamens 5-13; filaments very short. Female flowers very numerous, sessile or nearly so, adhering to the base of a large 3- or 5-lobed bract. Pe-

rianth consisting of 4 or 5 teeth or lobes, superior; styles 2-4, unequal. Drupes small, dry, seated on the enlarged wing-like 3-lobed bract.—Trees, with unpaired or almost paired leaves.

Leaflets entire, without net-veination, glabrous; base of female bracts hispid . . . . . *E. spicata.*
Leaflets serrate, rarely entire, with strong conspicuous net-veination and pubescent beneath; base of female bracts glabrous . *E. villosa.*

1. **E. spicata,** Bl.—A tree (60—70 + 30—14 + 6—8), shedding leaves in C.S., the young parts more or less tomentose or pubescent; leaves equally or slightly unequally pinnate, while young along with the rachis more or less densely pubescent, soon glabrescent; leaflets in 4-6 pairs, on short, thin, puberulous petiolules, from ovate- to elliptically lanceolate, unequal at the obtuse base, 4-5 in. long, shortly and bluntish acuminate or apiculate, chartaceous, entire, and when full-grown quite glabrous, penninerved, the nerves thin, without visible net-veination; male and female spikes forming a pendulous pubescent 6-8 in. long lax panicle, the female one terminal and persistent, the lateral basal male catkins scattered and deciduous, 5-6 in. long; perianth and anthers of male flowers sprinkled with short minute bristles, the bract usually minute and 3-lobed; the lateral lobes of the female perianth half the size of the median one, enlarging in fruit; base of the wing-like bract in fruit densely yellowish-hispid, the median lobe up to 1½ in. long, spatulate-linear, blunt, 1-nerved, penninerved, and conspicuously net-veined, chartaceous and glabrous, the lateral lobes conform, but only about half as long; nut the size of a pepper-kernel, hispid at the top.

Hab.—Frequent in the tropical forests from Chittagong, Pegu, and Martaban down to Tenasserim.—Fl. Feb.; Fr. March-Apr.—s.—SS.=*SiS.* Metam.

Remarks.—Wood white, soft. Good for furniture, turning, etc. Bark can be used for tanning.

2. **E. villosa,** Kz.—A tree (25—30 + 12—15 + 2—3), shedding leaves in H.S., rather stunted, the young parts all tawny-tomentose; leaves while young shortly and softly tomentose, equally or unequally pinnate, with a terete tawny-tomentose rachis; leaflets in 3-4 pairs, sessile or nearly so, unequally lanceolate to somewhat rhomboid-oblong, 2½-3 in. long, acute, especially towards the apex coarsely serrate, rather coriaceous, above somewhat wrinkled and rough from a minute tomentum, beneath strongly nerved and conspicuously net-veined, softly and shortly pubescent; female and male spikes on the same short panicle of only 2½-3 in. length, the female one terminal, the male catkins about 2 in. long or shorter, covered with short minute bristles, the lobes of the female perianth membranous and flaccid, obovate-cuneate, sprinkled with hairs, the

lateral ones less than half as long, the perianth-base almost glabrous.

VAR. 2. **integra**: leaflets entire, blunt, 4-4½ in. long, the petiolules 2-3 lin. long.

HAB.—Not unfrequent in the hill Eng forests of the Martaban hills east of Tounghoo, also Tenasserim, at 1,000 to 3,000 ft. elevation.—Fl. Nov.-March.—l.—SS.=Lat. Metam.

SALICINEÆ.

Flowers dioecious, in catkins, sessile or shortly pedicelled, supported by a membranous, persistent or deciduous bract. Perianth none, the torus swelling to become a gland or obliquely truncate ring or cup. Males: stamens 2 or more, exserted from the centre of the torus; filaments filiform, free or monadelphous; anthers 2-celled, basifix, the cells opening by longitudinal slits. Ovary-rudiment none. Females: ovary free, sessile or shortly stalked, consisting of 2 connate carpels, 1-celled, with numerous ascending ovules along the short, linear, parietal placentas; styles 2, usually connate, with an entire or 2-cleft stigma; capsule 1-celled, many-seeded, 2-valved, the valves opening at the apex and turning more or less revolute at the ripening of the fruit. Seeds erect, minute, the funicle dissolved into a woolly tuft surrounding the whole membranous testa. Albumen none. Embryo straight, the cotyledons elliptical, plano-convex.—Trees or shrubs, rarely under-shrubs, with alternating simple leaves. Stipules scale-like and deciduous, or leafy and often persistent.

The willows and poplars are the constituents of this order, of which, however, only a single willow occurs also in Burma. The bark is usually astringent, and that of some willows is used as a febrifuge. Osiers are best fitted for wicker-work, sallows for charcoal-making, while the wood of other species of *Salix* and *Populus* is light and white and used in turnery.

SALIX, L.

Bracts of the catkin entire. Male flowers: torus gland-like. Stamens 2-5, the filaments free or cohering at the base, rarely monadelphous. Female flowers: ovary 1-celled, with numerous ovules; style very short, with 2 stigmas. Capsule 1-celled, splitting from the apex into 2 valves, with numerous comose seeds.—Trees or shrubs, with entire or serrate leaves. Stipules scale-like and deciduous, or leafy and more persistent. Flowers in sessile or peduncled terminal or lateral catkins.

1. S. tetrasperma, Roxb.; Bedd. For. Fl., t. 302; Brand. For. Fl. 462, t. 58.—*Mo-ma-kha.*—An evergreen tree (25—30+4—10 +3—4), usually branched already shortly above the base, the young shoots densely appressed silky-pubescent; bark bony, even, irregularly and longitudinally fissured; cut light red; leaves variable, from linear- to oblong-lanceolate and oblong, on a petiole varying from ½ to 1⅓ in. in length, usually somewhat unequal at the obtuse or acute base, long-acuminate, 4-6 in. long, membranous to chartaceous, minutely serrate or entire, quite glabrous, or beneath pubescent or velvety puberulous, and here constantly glaucous; catkins elongate, lax and interrupted-flowered, lateral, on short, axillary, deciduous, greyish pubescent or tomentose branchlets furnished with 3-6 diminutive leaves, and hence the catkins appearing peduncled and axillary; scales cucullate, produced in a lobe and resembling a slipper in shape, greyish villous or tomentose; stamens 6-8, the filaments long and slender, free; stigmas 2, spreading; capsules ovoid, acuminate, more or less glabrous, about a line long, on a very slender puberulous stalk about 1½ lin. long.

Hab.—Frequent along hill-streams from Ava and Martaban down to Tenasserim, and descending along streams to the very tidal forests of Pegu and Tenasserim.—Fl. Feb.; Fr. Dec.—s l.—SS.=∞.

Remarks.—Wood yellowish white, soft. □′ =37 pd. Bark used for tanning.

CASUARINEÆ.

Flowers monoecious, in catkins. Male catkins terete, elongate or short, the flowers 2-bracteoled, sessile in the axil of the toothed sheaths. Perianth 2-parted, the segments decussate with the bractlets and cohering at their tips, deciduous; stamen 1, the filament exserted and thickened at the base; anthers 2-celled, the cells opening longitudinally. Female catkins usually axillary, globular or ellipsoid, the flowers arranged in several longitudinal rows, 1-bracted and supported by 2 lateral bractlets, both (bracts and bractlets) persistent. Perianth none; ovary with a single ovule suspended from the summit of the cell; style terminal with 2 filiform stigmas. Ripe cones woody indurated. Achene enclosed by the enlarged bractlets which at length open valvately, compressed, membranous, winged at the apex, containing a solitary pendulous seed. Testa connate with the endocarp. Albumen none. Embryo straight, with large flat cotyledons, the radicle minute, superior.—Trees, rarely shrubs, with numerous horse-tail-like jointed branchlets toothed at their joints, but without leaves. Flowers in terminal and lateral catkins, monoecious, but the males and females not appearing at the same time on the same tree.

A family consisting only of a single genus, of which most of the species are Australian. The timber is hard and heavy and of the colour of raw beef, whence it is called beef-wood in Australia.

CASUARINA, L.

Characters those of the order.

1. **C. equisetifolia,** Forst.; Brand. For. Fl. 435.—*Tin-yu.*—An evergreen tree (50—80+20—35+4—8), all parts glabrous; bark brown, corky and considerably cracked; the filiform, thin, slender branchlets arise from the woody rough branches and are jointed, the joints about 2 lin. long or a little longer, 7- or 6- or 8-cornered, terminating a toothed cup with as many teeth as corners to the joint; male catkins terminal on the branchlets, linear-cylindric, about ½ in. long, the female ones arising from short puberulous lateral branchlets with very shortened joints terminating into conspicuous subulate teeth; fruit-cones globular, oblong, about the size of a cherry, the achenes in about 12 rows, the enlarged woody branchlets puberulous, obovate-oblong, mucronate, about 2½ lin. long, somewhat thickened on the back.

Hab.—Not unfrequent along the sandy sea-shores of Chittagong, re-appearing again along the Tenasserim coast from Moulmein southwards.—Fl. Feb.-March; Fr. C.S.—l.—SS.=Aren.

Remarks.—Wood hard, heavy, red-brown, of a texture like toon (but held in no estimation according to Roxburgh). Well adapted for house-posts and fuel.

GNETACEÆ.

Flowers in catkins, dioecious or monoecious, rarely polygamous. Bracts numerous, very rarely distinct, but usually more or less connate into an entire circular cup or into a more or less deeply 2-lobed involucre. Male flowers: bractlets 2, connate and forming a perianth-like usually 2-lobed involucel to the anthers. Perianth none. Stamen 1, or few, inserted on the bottom of the involucel, the filament simple or 2-cleft at the apex, or if several are present, connate at the base; anthers 2-, very rarely 3-celled, opening by a terminal transverse slit or pore. Female flowers: Bractlets 2 to 4, decussately opposed and connate, forming a simple or double closed cup, only at the apex perforated, the outer cup, if present, winged and rarely enlarging with ripening of the fruit. Ovary solitary in the axil of the bractlets, 1-celled, with a single erect ovule; stigma obliquely ligulate, discoid or fringed. Seed solitary, enclosed in the dry or usually more or less fleshy urceole or both urceoles, and forming a fleshy or dry drupe. Albumen fleshy.

Cotyledons 2, large, or small and tooth-like; radicle superior.—Trees or shrubs, often scandent, with jointed branchlets. Leaves either broad and opposite, or reduced to a minute 2-4-toothed sheath at the joints. Flowers forming interrupted or imbricate dense globular to cylindrical catkins arranged singly or by 2 or a few on a brachiate branched peduncle.

A small order of very little interest to the forester and possessing no particular qualities. The seeds of *Gnetum* are eaten by natives.

GNETUM, L.

Flowers monoecious or dioecious, intermixed with bristle-like jagged, jointed, white or rusty-coloured scales. Catkins cylindrical, jointed, the female ones often interrupted. Male flowers: involucel 2-valved. Stamen 1 only, the filament simple or 2-forked at the apex; anthers didymous, the cells contiguous or sometimes discret on the forkings. Female flowers: involucel consisting of decussate bractlets connate by pairs and forming an outer and an inner urceole, each perforated at the apex. Ovary solitary, erect; style long, filiform, with a fringed stigma. Seed quite enveloped in the 2 enlarged fleshy or fibrous-fleshy urceoles and resembling drupes. Embryo embedded at the apex of the fleshy albumen; cotyledons 2, minute and tooth-like, the radicle terminating into a very long intricately flexuose thread.—Usually large scandent shrubs, rarely erect trees or shrubs, with broad, opposite, entire leaves, the branchlets thickened-jointed.

* *Fruit narrowed into a longer or shorter stalk; hair-like scales round the flowers tawny or rusty-coloured. Dioecious climbers.*

Fruit, especially while young, covered with silvery scales, the stalk thick and short; leaves of a thinner texture with a very lax thin net-veination . . . . . *G. edule.*

Fruits quite glabrous, the stalk slender, about 2-3 lin. long or longer; leaves rigidly coriaceous, the net-veination rather close, elegant and conspicuous . . . . . *G. funiculare.*

** *Ovary and fruit sessile and glabrous.*

Dioecious climber; leaves rigidly coriaceous, turning black in drying; hairs round the ovary very copious, brown . . *G. neglectum.*

Monoecious erect shrub or treelet; leaves thick-membranous, remaining yellowish green in drying; hairs round the flowers copious, white . . . . . *G. gnemon.*

1. **G. edule,** Bl.—*Gyoot-nway.*—An evergreen, lofty, scandent shrub, dioecious, with the trunk somewhat flattened, 4-5 ft. in girth, all parts quite glabrous; bark about a line thick, blackish, longitudinally swollen and lenticellate-rough; leaves ovate-oblong to oblong, on a $\frac{1}{2}$-$\frac{3}{4}$ in. long petiole, shortly and bluntish acuminate or almost apiculate, 5-7 in. long, obtuse or rounded at the base,

thin-coriaceous, entire, smooth and glossy, the net-veination between the thin nerves lax and rather obsolete; catkins by 3 or more in brachiate stiff panicles arising solitary or by pairs from the stem or at the end of the branchlets; peduncles and ramifications long, stiff, terete, the branchlets terminated by a 2-cleft cymbiform involucre at the joints; cup-shaped involucres circular, in the males approximate and imbricate, in the females interrupted and much shorter; flowers surrounded by numerous filiform rusty-brown scales; drupes elliptical to oblong, when fully ripe 1-1½ inch long, blunt at the apex, narrowed into a very thick nearly 3 lin. long stalk, while young densely, when fully ripe sparingly, silvery scaly, orange-coloured, sappy, edible.

Hab.—Frequent in the tropical and moister mixed forests, from Arracan, Pegu, and Martaban down to Tenasserim and the Andamans, up to 2,000 ft. elevation.—Fl. March-Apr.; Fr. R.S.—s : l.—SS.=SiS., Metam., etc.

Remarks.—Wood very coarsely fibrous, porous, yellow, rather heavy, but of no use except possibly for rough cordage.

2. **G. funiculare,** Bl.—*Gyoot-nway.*—An evergreen large scandent shrub with a stem as thick as the arm, all parts quite glabrous; leaves variable, from oblong to obovate-oblong and oblong lanceolate, on a strong petiole ½-¾ in. long, acute or obtuse at the base, 5-7 in. long, shortly acuminate or apiculate, entire, glabrous, very glossy above, thick coriaceous, the net-veination between the strong but little prominent nerves elegant, rather close and conspicuous; catkins long-peduncled, by 3 or more in brachiate stiff peduncled panicles arising laterally from the older branches or terminal at the end of the branchlets, furnished with a 2-cleft small cymbiform involucre at the jointings; cup-shaped involucre circular, in the males more approximate, but not imbricate, in the females interrupted and twice as long as in *G. edule;* flowers surrounded by copious tawny or rusty-coloured hairs often protruding beyond the involucre-cup; fruits—also while young—quite smooth, contracted into a slender stalk about 3 lin. long or longer, ovoid or ovoid-oblong, about ½-¾ in. long, apiculate.

Hab.—Not rare in the tropical forests from Chittagong and Martaban down to Tenasserim.—Fl. March; Fr. Begin. of R. S.—s : l.—SS.=SiS. Metam., etc.

3. **G. neglectum,** Bl.—An evergreen large scandent shrub, dioecious, all parts glabrous; leaves oblong to elliptically lanceolate, on a petiole about 2½-3 lin. long, shortly acuminate to apiculate, 3-4 in. long, entire, rigidly coriaceous, very glossy above, the nerves and the lax veination strong but obsolete; female catkins interrupted, the circular cup-shaped involucres rather spreading; flowers surrounded by copious brown or rusty-coloured short hairs; ovary

quite glabrous, ovoid, acuminate; fruits (according to Griffith) lanceolate-ovate, apiculate, sessile, and quite smooth.

HAB.—Arracan, and forests of South Tenasserim.

4. **G. gnemon,** L.—An evergreen tree (10—15 + 4—5 + 1½—2), usually remaining shrubby, monoecious, erect, all parts quite glabrous; leaves oblong-lanceolate to elliptically-oblong, acute at the base, on a slender petiole 3-4 lin. long, longer or shorter acuminate, thick-membranous, glabrous, also in a dried state yellowish green, the nerves thin and the net-veination very lax and often obsolete; catkins up to an inch long, androgynous, peduncled, by 1-3 or rarely by 5, forming a peduncled small brachiate panicle in the axils of the leaves or at the end of the branchlets; involucre-cups almost membranous, spreading or reflexed, waved, rather distant; male and female flowers together and surrounded by copious short white hairs; ovary sessile, smooth, acuminate; drupes sessile, oblong, apiculate, smooth and glossy, orange-coloured, about ½ in. long.

HAB.—Frequent in dense forests of South Tenasserim.—Fl. Feb.

CONIFERÆ.

Flowers monoecious or dioecious, in catkins. Bracts in males numerous, inserted to the rachis, more or less crowded and imbricate, at the base very often narrowed into a stalk, peltate or half-peltate at the apex, sometimes produced on the back in a resinous gland, bearing the anthers on the under-surface or laterally. Stamens usually reduced to sessile anthers, or rarely with a short filament, by 2 or more under each bract, the anther arranged in a single or double row, 1-celled, opening by a longitudinal (rarely by a transverse) slit. Bracts in females 4 or more, free or more or less connate, arranged in spirals, decussately or in whorls of 3 or 4 each, the lower and uppermost ones sometimes sterile, membranous, chartaceous or coriaceous, or (along with the rachis) fleshy. Involucre (in *Taxineæ*) simple or double, short or urceolate and enclosing the ovary. Ovaries 2 or more, rarely solitary, usually collateral or superposed, more or less compressed, with a solitary orthotrop ovule; style short or very short; stigma almost orbicular, often more or less 2-cleft. Fruit-cones either consisting of coriaceous or woody imbricate or decussate scales, or of variously connate fleshy ones and truly or spuriously drupaceous. Nuts by 2 or more, rarely solitary, usually shorter than the scales; pericarp usually bony, woody or membranous, often with 1 or 2 or 3 wings, rarely wingless. Embryo (sometimes several embryos in the same seed) resting in the axis of the oily-fleshy or mealy albumen and almost as long; cotyledons 2, but often deeply lobed so as to simulate

3-5 separate cotyledons, the radicle short, inferior or superior.—Trees or shrubs, usually evergreens, abounding in resins, with usually clustered or solitary linear or more or less terete or angular, rarely broad leaves. Catkins terminal, solitary or variously clustered, racemose or racemose-panicled.

An order which is represented only by 5 species in Burma, but which is of the highest importance to the forester, especially of temperate climates. Deal, fire, pine, and cedar are all woods generally known, but the timber of most of the other species is of equal value. Some of them attain an enormous height, like the mammoth-tree, which reaches 330 and even 450 ft. in height, with a girth of 80-100 ft. Oil of turpentine, pitch, balsams and resins are yielded by trees of this family in great quantity.

* *Females in cones, consisting of numerous imbricate woody or coriaceous scales; ovary without a surrounding receptacle.*

Cones dry, the scales free, usually woody; leaves acicular, solitary, or by 2-5, in a short sheath . . . . . *Pinus.*

* * *Females solitary, the ovary and nut surrounded by a single or double often fleshy receptacle, enclosed in the enlarged scales and often resembling a fleshy or dry drupe.*

Bracts in males dilated at apex; fruits seated within the bracts and surrounded by the outer loose somewhat fleshy or coriaceous involucre; leaves usually dimorphous, scale-like and acerose . . . . . *Dacrydium.*

Bracts in males not or little dilated; fruit fleshy, inversed, seated on a fleshy thick receptacle; leaves many or 1-nerved, often broad . . . . . *Nageia.*

PINUS, L.

Flowers monoecious, in catkins. Scales numerous, narrowed at the base or almost stalked, the males bearing the 2 anthers on the under-surface. Anthers almost globular or oblong, 1-celled, opening by a longitudinal or almost transverse slit. The female scales composed of a fleshy or coriaceous lepidium and a thin bract either distinct or adnate to the base. Ovaries by pairs at the base of the scales, collateral, inversed, adnate to the scale; style very short; stigma orbicular or 2-cleft. Cones from globular to cylindrical, covered with numerous imbricate coriaceous or usually woody scales either equal at the apex or terminated by an usually mucronate opercle. Nuts in pairs or solitary by abortion, with a membranous or bony pericarp, winged or wingless. Embryo in the axil of an oily-fleshy albumen; cotyledons 3-15, linear; radicle inferior.—Evergreen trees, with linear or acicular half-terete or angular leaves either solitary or clustered by 2-5 and sheathed at the base.

Leaves by threes; opercle of scales not zonate . . . . *P. kasya.*
Leaves by pairs; opercle zonate . . . . . *P. Merkusii.*

1. **P. kasya,** Royle; Brand. For. Fl., 508.—*Tin-yu.*—An evergreen tree (60—100+30—40+9—10), all parts glabrous, the shoots resinous; bark very thick, corky-lamellate and cracked leaves 7-9 in. long, arising by threes from a sheathed base, very thin, half-terete, sulcate above, acute; ripe cones usually by 2 or 3, more or less ovate, about 3 in. long, the scales woody, much thickened towards the apex and extended into an almost rhomboid, depressed-pyramidal, not zonate opercle transversed by a keel and terminated by a depressed umbonate tubercle.

Hab.—Forming forests in the Martaban hills at 3,000 to 7,000 ft. elevation; also in the higher hills of Chittagong (Lushai country).—Fr. March.—l.—SS.= Metam.

Remarks.—Wood fibrous, but rather close-grained, light, pale brown with darker waves, very resinous.

2. **P. Merkusii,** Jungh.—*Tin-yu.*—An evergreen tree (50—60 +(?)+6), all parts glabrous; leaves 8-10 in. long, arising by pairs from a sheathed base, thin, half-terete, sulcate above, pungent-acute; cones about 3 in. long or somewhat longer, ovate-oblong, the scales woody, much thickened upwards and dilated into an almost rhomboid (or the lower ones 5-gonous) transversely zonate opercle thickened towards the end into a transverse ridge with a depressed scar.

Hab.—Common in the hill Eng forests along the Salween river in Martaban and Thoungyeen of Upper Tenasserim, at elevations from 500 to 2,500 ft.—Fr. Apr.—l.

DACRYDIUM, Sol.

Flowers dioecious, in catkins. Male catkins terminal, solitary, from ovoid to cylindrical, small. Anther-bearing bracts usually many, crowded and very shortly stalked. Anthers 2, 1-celled, the cell almost globular, dehiscing outwards. Female flowers usually solitary, rarely collected by 3-9 in a stiff but lax spike, the rachis rather thick. Bracts somewhat fleshy, 1-flowered. Ovary ovoid-oblong, surrounded by a double involucre: the outer one shorter, formed of a single bractlet and somewhat cup-shaped, the inner one consisting of 2 bractlets connate at their margins, and forming an utricle produced at the apex into a short or very short neck with a gaping mouth; style short. Nut minute, almost long, at the base surrounded by the short lax outer involucre and enclosed in the inner somewhat fleshy or coriaceous involucre gaping at the apex. Embryo at the summit of the mealy or granular albumen, with 2 cotyledons.—Evergreen trees or shrubs, with acicular laxly or densely imbricated leaves often dimorphous.

1. **D. elatum,** Wall.—An evergreen tree (30—60+(?)+3—

4), all parts glabrous; leaves variously shaped and of 2 sorts, the one scale-like and densely imbricate, ovate-linear, blunt, mucronate or truncate, the others acicular, about 4-8 lin. long, pungent-acute, somewhat 4-cornered, slightly curved; male catkins linear-cylindrical, blunt, the anther-bearing bracts ovate, acute or acuminate, with 2 almost globular anthers underneath; female catkins and nuts solitary and arising laterally from long slender branchlets; nuts oval-oblong, blunt, about 1½ lin. long.

HAB.—Burma, without locality (probably Tenasserim).

NAGEIA, Gaertn.

Flowers dioecious, in catkins. Male catkins terminal or usually axillary, solitary or clustered, at the base bracted or naked. Anther-bearing bracts numerous, crowded, very shortly stalked. Anthers 2, 1-celled, almost globular and dehiscing extrorsely. Female flowers solitary or few, in reduced spikes, the bracts usually connate with the fleshy rachis and free only at the apex, or altogether confluent into a fleshy thick rachis. Ovary enclosed by a double involucre; the outer one adnate to the inner urceolate involucre and gaping at the apex. Fruit fleshy, with a bony pericarp, almost globular or ovoid, inversed, usually seated on the fleshy thickened rachis. Embryo at the summit of the mealy albumen.—Evergreen trees, rarely shrubs, with 1- or more-nerved broad or narrow leaves.

Leaves opposite or nearly so, many-nerved, oblong-lanceolate . *N. latifolia.*
Leaves scattered, 1-nerved, linear to linear-lanceolate . . . *N. bracteata.*

1. **N. latifolia,** Gord. (*Podocarpus latifolius*, Wall.; Bedd. Sylv. Madr., t. 257).—*Thit-min.*—An evergreen large tree 60-80 feet high or higher, all parts glabrous; leaves opposite or nearly so, oval-lanceolate to lanceolate, 4-5 in. long, acuminate at both ends, many-nerved, coriaceous, the nerves thin; male catkins arising by 2-5 from a short, few-bracted, axillary peduncle, cylindrical, blunt, the anther-bearing bracts ovate, acuminate, minutely toothed; female catkins 1-flowered, on a fleshy thickened rachis; fruits almost globular, fleshy, the size of a small cherry, bluish black, solitary, and resting on a thick, fleshy, few-bracted receptacle.

HAB.—Not unfrequent in the tropical forests of the Martaban and Tenasserim hills, ascending into the damp hill forests.—s.—SS.=Metam.

2. **N. bracteata** (*Podocarpus bracteatus*, Bl.).—*Thit-min.*—An evergreen tree (40—50+15—20+4—6), all parts glabrous; leaves linear, 4-6 (in saplings up to 8) in. long, 1-nerved, more or less rigidly coriaceous, acuminate, or in old leaves acute, petiole-

like narrowed at the base; male catkins axillary, solitary or more usually several together and sessile, each catkin involucred at the base, the bracts of the involucre broadly ovate, keeled, acute; female peduncles axillary, 1-flowered; fruits globular, the size of a large pea, resting on the thick, fleshy, oblong receptacle.

HAB.—Not unfrequent in the tropical forests and ascending into the damp hill forests, from Martaban and Tenasserim to the Andamans, up to 3,000 ft. elevation.—s.

REMARKS.—Wood pale brown, rather heavy, close-grained. □′=50 pd. May prove a substitute for box-wood. Good for planks, oars and masts of boats.

CYCADEÆ.

Flowers dioecious, the males in large cones consisting of numerous thickened, flat or variously peltate scales bearing the numerous pollen-cells on the under-surface or on both surfaces. Pollen-cells dehiscing by a longitudinal slit, sessile or very shortly stalked, often stellately connected by 3 or 4, rarely free. Female flowers either consisting of a carpellary leaf (*spadix*), and in this case crowded round the apex of the trunk, or more usually consisting of flat or thickened or variously peltate scales forming a large cone. Ovules large, sessile, either several, inserted along the border of the spadical stalk, or solitary at each side of the scale. Seeds more or less ovoid, dry and hard, or the integument thin and coloured outside and fleshy under the epidermis so as to appear somewhat drupaceous. Endosperm copious, fleshy or more usually hard and bony. Embryo usually solitary by abortion, minute, the radicle continuous with the persistent suspensory thread; cotyledons 2, oblong, the plumule distinct.—Small trees, with a thick simple or sometimes branched often scared trunk, or the trunk very short or altogether subterranean. Leaves usually pinnate, rarely simply or doubled pinnatisect or supra de compound, of a very firm texture, and arising from and around the apex of the trunk. Flower-cones often peduncled, cylindrical or ovoid, terminal or lateral.

All species abound in a mucilaginous nauseous juice, with which is often mixed a great quantity of starch, which sometimes serves for food to the natives. Only 3 species occur in Burma.

CYCAS, L.

Scales of the male cones closely imbricated, more or less cuneate and often produced in an acumen, the under-side covered with pollen-cells. Female spadices loosely imbricated round the top of the trunk, rather thick, narrowed into a shorter or longer stalk, and more or less dilated above the ovules in a narrow or broad almost entire or pectinate blade. Ovules 1-5 on each side of the carpellary

stalk, distant, alternate or opposite, more or less immersed and almost erect.—Small trees, with simple or rarely branched trunk or stemless. Leaves pinnatisect or pinnate, the segments 1-nerved, the lower pinnules often reduced to spines on the petiole. Male cones large, shortly stalked, cylindrically oblong or ovoid.

* *Fruits densely tomentose* . . . . . *C. revoluta.*
* * *Fruits, at least when ripe, glabrous.*
○ Trunk 6-30 ft. high, epigeous; ovules from 2-5 on each side of the frond-stalk.
Female spadices with a pectinate-toothed sterile lamina tapering in a pectinate-serrate acumen . . . . . *C. circinalis.*
Female spadices with a sparingly toothed or almost entire sterile lamina, the acumen quite entire . . . . . *C. Rumphii.*
Female spadices with a very broad, deeply pectinate, lacerate, sterile lamina, the acumen entire . . . . . *C. pectinata.*
○ ○ Trunk subterranean or shortly protruding from the ground; ovules solitary on each side of the frond-stalk.
Female spadices with a very broad, deeply pectinate, lacerate, sterile lamina, the acumen broad and as long as the lamina itself, with a few spiny serratures . . . . . *C. Siamensis.*

1. **C. Rumphii,** Miq.; Bedd. Sylv. Madr., 227.—*Mong-tain.*—An evergreen palm-like tree (20—25 + 8—10 + 3—4), with a thick cylindrical scared trunk either simple or when old branched, all parts glabrous; leaves crowded at the top of the trunk, 2-4 ft. long, glabrous, pinnate, and towards the summit pinnatisect, the segments elongate-linear, 6-10 in. long, acuminate, 1-nerved, without visible veins, the lower pinnules reduced to reflexed, short, straight spines along the obscurely 3-gonous petiole; male flower-cones about 1½ ft. long, erect, on a short, thick, linearly-scaled peduncle, the flower-scales about 1½ in. long, obovate-cuneate, with the lateral angles sharply prominent and forming a triangular thickened apex and produced in a long, thick, more or less reflexed or recurved rusty-tomentose acumen, glabrous above, beneath covered with stellately connected pollen-cells; the female carpellary leaves very long-stalked, densely tawny-villous, those of the outer rows up to a foot long or somewhat longer, becoming shorter towards the centre, the blade from ovate to ovate-lanceolate, very little toothed or lobed along the margin and terminating in a very long entire acumen; ovules immersed in the prominent cymbiform and shortly acuminate receptacles, about 3-5 on each side of the broad upper part of the petiole (or more correctly the fertile lower part of the blade); fruits glabrous, ovoid-oblong, the size of a hen's egg, orange-yellow.

Hab.—Frequent in the beach forests of the sea-coast of South Tenasserim and the Andamans.—Fl. C.S.; Fr. H.S.—l.—SS.=Aren.

Remarks.—Wood coarse, medullary-fibrous. The wood yields a good quantity of sago or starch, the seeds are in Ceylon made into flour. Exudes a good sort of resin, which is applied to malignant ulcers, and which excites suppuration in an incredibly short time.

2. **C. pectinata,** Griff.—An evergreen simple-stemmed palm-like tree about 8-10 feet high, all parts glabrous; leaves pinnate, 4-5 ft. long, glabrous, the segments narrow-linear, 7-8 in. long, acuminate, 1-nerved, the margins rather revolute, the lowest ones along the petiole reduced to short straight spines; male cones ovoid, the male scales cuneate with a broad 3-angular apex abruptly produced into a subulate tomentose acumen about an inch long, glabrous, except outside on the apex, 1½-2 in. long; female spadices crowded on the top of the trunk, very densely tawny-villous, 4-5 in. long, the stalk short and broad, bearing about 3 glabrous ovules on each side, the blade large and much longer than the stalk, almost orbicular, and terminated in a strong subulate almost entire acumen of about an inch in length, all round cut into strong, subulate-acuminate, pectinate, spiny teeth of ½-¾ in. length; fruits ovoid, the size of a goose-egg, smooth and glabrous, orange-red or yellow.

HAB.—In the hill Eng and pine forests of Martaban and Tenasserim; also Chittagong (?)—l.—SS.=Metam. Lat.

3. **C. Siamensis,** Miq.—An evergreen, low, stemless, palm-like tree, the trunk cylindrically oblong, up to 2½ or 3 ft. long by 2-3 ft. girth, buried in the ground or slightly raised above it, the young leaves and more especially the rachises rusty-villous, but soon turning glabrous; leaves up to 2 ft. long or somewhat longer, pinnate, upwards pinnatifid, with the rachis sparingly appressed hairy, the segments 3-5 in. long, linear, sharply mucronate-acuminate, 1-nerved, and of a thinner texture than that of other species, the lower pinnules reduced to short straight spines along the petiole; stipules and bracts all rusty-villous; male cones ovate-oblong, from 9-12 in. long, on a short subulate-bracted rusty-villous peduncle, the male scales small, only about ¾ in. long, terminating into a slender acumen of the same length or somewhat longer than the scale itself, cuneate with a triangular apex; female spadices terminal, crowded, shortly stalked, the stalk tawny-villous, only 2-3 in. long, those of the inner rows shorter to almost sessile, the sterile blade triangular-ovate to obovate-oblong, broad, while young beneath wholly rusty- or tawny-villous, soon turning glabrous on the upper half, long and broadly acuminate and deeply pectinate-lacerate, the acumen about 2 in. long, cut into several spiny teeth, the pectinate marginal teeth up to an inch long and longer, strong, refracted and spiny-acuminate; ovules solitary on each side at the narrowed base of the sterile blade; fruits obovoid-oblong, a little compressed, smooth, from yellow to orange-coloured, about 1½ in. long.

HAB.—Frequent in the Eng and dry forests of the Prome district.—Fl. Fr. March-Apr.—l.—SS.=Lat. CaS.

REMARKS.—Exudes a peculiar whitish gum like tragacanth.

II. MONOCOTYLEDONS.

MUSACEÆ.

Flowers hermaphrodite or hermaphrodite-unisexual, irregular. Perianth superior, corolla-like, 6-parted, in 2 distinct rows, the outer perianth 3-phyllous, the inner 3 segments developed, or the 2 perianths united into 2 lip-like segments. Stamens 6, adnate to the base of the perianth or free, or often the posticous stamen abortive; anthers linear, 2-celled, turned inwards. Ovary inferior, 3-celled, with many or rarely a solitary ovule in each cell; style simple; stigma usually 3-lobed. Fruit either a 3-celled woody capsule opening loculicidally or succulent and indehiscent or irregularly bursting. Seeds usually imbedded in pulp, or rarely with a hair-like arillus, the testa usually crustaceous. Albumen mealy. Embryo straight, oblong-linear or mushroom-shaped.

A small order of great economical importance, but of little value to the forester. It contains only a single woody tree, the rest being either low or tree-like tall herbs. The plantains and banana are well known as nutritive fruits, and many, if not all, of the species of *Musa* yield more or less valuable fibre, amongst which the Manilla hemp (*Musa textilis*) is best known in commerce. The juice of most plantains may be used for blackening leather, etc.

RAVENALA, Sonn.

Perianth-segments 6, the outer ones equal with the frontal one, keeled, the inner somewhat smaller, the lateral ones approximate, equal, embracing the genitals, the posticous almost conform and somewhat shorter. Stamens 6, all perfect. Ovary inferior, 3-celled, with numerous horizontal ovules attached in 2 series to the inner angle of the cells; style rather strong; stigma funnel-club-shaped. Capsule woody, loculicidally 3-valved. Seeds numerous, depressed-globular, with a blue hairlike-divided arillus. Albumen almost bony. Embryo straight, mushroom-shaped.—Trees, with long-petioled sheathing simple leaves arranged distichously like a fan. Flowers bracteoled, clustered in the axils of the cymbiform alternately distichous spathes.

1. **R. Madagascariensis,** Sonn.—An evergreen palm-like tree (12—30 + 6—20 + 2—3), all parts glabrous, the trunk annulate, grey; leaves distichous and much crowded at the apex of the trunk, elongate-oblong, on a 3-5 ft. long petiole long-sheathing at the base, unequally cordate at the base, and as long or more usually shorter than the petiole, coriaceous, smooth, and glossy on both sides;

racemes robust, axillary, and shorter than the petiole, glabrous, the bracts distichous, elongate, boat-shaped, 1-2 ft. long, overlapping with their cordate bases, thick-coriaceous and stiff, pungent-acuminate and slightly twisted, smooth, green; flowers large, whitish, sessile, half-whorled at the base of the bract; perianth-segments linear, $2\frac{1}{2}$-3 in. long, the inner ones shorter and narrower; filaments an inch long, broader than the very long linear anthers; style as long as the perianth; capsules oblong, 2-3-cornered, 2-3 in. long, tardily dehiscing into 3 woody valves, brown, glabrous; seeds numerous, oblong, covered with a beautifully azure, fibrous arillus.

Hab.—Only rarely cultivated in gardens of Europeans.

PANDANEÆ.

Flowers dioecious or polygamous, naked, on simple or branched spadices, protected by many spathes. Male flowers: stamens naked, simple or variously connate; anthers erect, 2-celled, the cells dehiscing longitudinally, truncate, or the connective produced. Female flowers: ovaries naked or rarely surrounded by sterile stamens, solitary or several, united into a bundle, 1-celled, the ovules solitary or numerous and inserted in 2 series along the 2-7 parietal placentas; stigmas often sessile. Drupes fibrous-woody or fleshy, free or variously connate, 1- or many-seeded. Testa membranous or rarely crustaceous. Albumen fleshy. Embryo almost basal, small, with an inferior radicle.—Trees, branched or simple-stemmed, or shrubs, often scandent, or supported by strong aëral roots. Leaves simple, elongate, sessile, parallel-nerved, often spiny along the margin, distichous or arranged in a triple or rarely simple spiral. Drupes simple or compound, collected in more or less compact heads (*syncarps*).

An order of little importance. The wood is coarse-fibrous, with age becoming bony and hard on the outside. The leaves of most screw-pines serve for making mats, cordage, etc.

Erect trees or shrubs; ovary-cells usually 1-ovuled, the ovules basal . . . . . *Pandanus.*
Scandent shrubs; ovary 1-celled, with numerous ovules along the 2-7 parietal placentas . . . . . *Freycinetia.*

PANDANUS, L.f.

Flowers dioecious. Males: spadix compound, fleshy, at the base and at the branchings furnished with usually yellow or white-coloured spathes. Stamens very numerous, single or more usually variously united into bundles; anthers erect, 2-celled. Females: spadix often simple, rarely branched, similarly protected by pale green rarely whitish leafy spathes. Ovaries free or connate, 1-celled,

with a solitary erect ovule attached to the base of the parietal placenta; stigmas sessile or raised on a style, various. Drupes fibrous-woody, with a fleshy epicarp, arranged into compact heads, free or united into bundles, usually angular-pyramidal, 1-seeded, or (in the phalangal bundles) with about as many or fewer seeds than drupes thus united. Putamen bony, hard. Seeds large, strophiolate, the testa white, membranous. Albumen fleshy. Embryo small, almost basal, the radicle inferior.—Simple-stemmed or more usually branched palm-like trees or shrubs, with elongate, spirally arranged, often spiny-armed leaves. Drupes simple or compound.

* *Drupes simple.*
× Stigmas simple, spiny-acuminate, continuous with the apex of the drupe; stamens free; anthers acuminate.
Shrubby, soboliferous; drupes quite smooth . . . . *P. fœtidus.*
×× Stigmas spinescent and often depressed, usually 2-3 forked, horny and deciduous; stamens palmately connate; anthers aristate or apiculate.
Large robust tree; leaves 2-4 in. broad, spiny-armed; stigmas forkedly 2-3 spinous . . . . . *P. furcatus.*
Slender and thin-stemmed; leaves only 3-4 lin. broad, minutely spinulose; stigmas very short, blunt . . . . . *P. graminifolius.*
** *Drupes united into phalanges (rarely the one or other simple); stigmas sessile or nearly so, reniform or peltate; stamens racemose-united, the anthers aristate.*
× Leaves spiny along the margins and midrib.
Leaves dark green, 4-5 in. broad, 15-18 ft. long; phalanges the size of the fist . . . . . *P. Leram.*
As former, but drupes only 2 in. long; leaves gradually acuminate . . . . . *P. Andamanensium.*
Leaves glaucous or whitish, 3-5 ft. long . . . . . *P. odoratissimus.*
×× Leaves with smooth margins.
As former, but all parts without spines . . . . . *P. lævis.*

1. **P. fœtidus,** Roxb.—*Tha-kyet,* or *tau-tha-kyet.*—An evergreen, soboliferous, prostrate caulescent shrub, 3-5 ft. high; leaves linear, coriaceous, somewhat flaccid, acuminate, 4-6 ft. long, glaucous-green, along the margin and beneath along the midrib (towards the base antrorsely and retrorsely) spiny and often so, but minutely, above on the plaits towards the point, the spines curved or almost straight, whitish, rather strong; spathes beautifully yellow, glossy, finely spinulose-ciliate on the margin and on the midrib, disagreeably smelling; stamens free and simple with very short filaments, the connective mucronate-elongated; syncarp drooping, solitary, oblong, varying in size from a hen's to an ostrich's egg, when fully ripe reddish and fibrous-fleshy; drupes quite smooth, pyramidate, 5-6-gonous, terminating in a rather long simple spinescent persistent stigma.

Hab.—Frequent in the tidal forests from Chittagong, Arracan, and Pegu down to Tenasserim.—Fl. C.S.; Fr. June-Nov.—l.—SS.=Sal.

2. **P. furcatus,** Roxb.—An evergreen palm-like tree (10—30 + 4—20 + 1—1½), divaricately and sparingly branched, supported at the base by strong aëral roots; leaves elongate-linear, 8-15 ft. long by 2-4 broad, coriaceous, very acuminate, dark green, armed with short incurved spines along the margin and beneath on the midrib, the spines up to 2 lin. long, complanate, greenish, then brownish; spathes inodorous, thick-coriaceous, very acuminate, spiny-ciliate on the borders and beneath on the midrib; stamens united by 8-14 into stalked bundles, the connective bristly produced; syncarps solitary or racemose (if solitary very large, if racemose proportionally smaller), up to 1½ ft. long and half as thick, oblong to elliptically oblong, when fully ripe fibrous-fleshy and orange-red; drupes connate, obconical-pyramidal, 5-6-gonous, convex at the apex, the stigmas bony, glossy-brown, spiny 2-3-forked, rarely simple.

Hab.—Frequent in the tropical forest from Chittagong, Pegu, and Martaban down to Tenasserim, up to 2,000 ft. elevation.—Fr. C.S.—s.—SS.=Metam. SiS., etc.

3. **P. graminifolius,** Kz.—An evergreen slender screw-pine; leaves narrow-linear, long subulate-acuminate, 1-1½ ft. long by 3-4 lin. broad, coriaceous densely spinulose on the borders, beneath distantly appressed-spinulose on the midrib, the spines minute, straight, appressed; spathes of females slightly spinulose on the margin towards the apex; syncarps (unripe) erect, oblong or elliptically oblong; young drupes simple, the stigmas almost sessile, 3-gonous.

Hab.—Tenasserim.

4. **P. Leram,** Jones.—An evergreen tree (30—50 + 15—30 + 3—5), supported by long strong aëral roots, more or less candelabre-like branched, armed; leaves coriaceous, elongate-linear, 8-15 ft. long by 2-3 in. broad, spiny on the margin and on the midrib beneath, long and subulate-acuminate, dark green; syncarps up to 2 or 3 ft. long and nearly 1½ to 2 ft. thick, ovoid or elliptical to almost globose, sea-green, at last brown when ripe, the drupes wholly connate, obovate-clavate, the size of the fist, medullary-woody-fibrous, smooth; stigmas sessile, large, auricular-orbicular, somewhat waved on the margins.

Hab.—Marshy places in the coast forests of the Andamans.—Fr. C.S.—s.

5. **P. Andamanensium,** Kz.—An evergreen tree (40—50 + 30—40 + 2—3½), hardly rooted at the base, simple-stemmed or shortly branched at the apex; leaves elongate-linear, coriaceous, 15-18 ft. long by 4-5 in. broad, dark green and glossy, long and gradually acuminate, thinly spiny on the borders and on the midrib beneath, the spines up to ½ lin. long, curved or almost straight, whitish or glossy brown towards the sharp point; syncarps solitary, oval or

globular, the size of a man's head, drooping; drupes connate, obversely turbinate and usually rhomboid-compressed, rather flat at the apex, when fully ripe fibrous-fleshy and scarlet; stigma obliquely depressed-3-gonous, lamellate-produced, often prickly-acute.

Hab.—Frequent in the tropical forests of the Andamans, especially in the neighbourhood of the sea.—Fr. Apr.-May.—s.—SS.=Metam. SiS.

6. **P. odoratissimus,** L.f.—*Tsat-tha-pu.*—An evergreen tree (15—25+5—10+2—3), divaricate-erect, much branched tree or rather arboreous shrub, resting on strong, stiff, aëral roots, rarely prostrate and shrubby; leaves elongate-linear, coriaceous, almost whitish-glaucous or glaucous-green, 3-5 ft. long, long-acuminate, the margins sharply antrorsely, the midrib beneath antrorsely and retrorsely, spiny, the spines rather straight, 3-4 lin. long, or in a variety only half as long, whitish with purplish points; male spadix strongly scented, the cymbiform-lanceolate, white spathes spinulose on the keel and on the margins; stamens racemose-connate, the connective aristate; syncarps solitary, drooping, the size of a man's head or smaller or larger, globular to oblong, beautifully scarlet; drupes connate, 2-3 in. long, fibrous-woody with a fleshy epicarp, glossy, tesselate and rather convex at the apex; stigmas, 3-gonous-reniform, rather small.

Hab.—Common along the sandy shores all along the coast of Burma from Chittagong down to Tenasserim and the Andamans.—Fl. Fr. ∞—l.—SS.=Aren.

7. **P. lævis,** Rumph.—An evergreen tree (20—25+5—10+2—3), much branched and supported by numerous aëral roots, sometimes remaining prostrate and shrubby, unarmed; leaves elongate-linear, glaucous-green, 2-4 ft. long by 2-2½ in. broad, very acuminate, without any spines; male spadix very scented, exactly as in the preceding species, but the margins and midrib of the white spathes quite unarmed; stamens racemosely connate; anthers mucronate; fruits unknown as yet.

Hab.—Only cultivated in villages of Pegu and probably elsewhere in Burma.

FREYCINETIA, Gaud.

Flowers dioecious, or rarely spuriously polygamous, in simple or branched spadices. Males: stamens free, naked; anthers 2-celled, opening longitudinally. Females: ovaries naked, or surrounded by sterile stamens, united into bundles, 1-celled, with as many parietal placentas as sessile stigmas; ovules numerous, attached in 2 series to the placentas. Berries united in a fleshy syncarp. Seeds very numerous, minute, spindle-shaped, strophioled, the testa membranous or crustaceous. Albumen fleshy. Embryo minute,

basal, the radicle inferior.—Scandent slender shrubs, with 2- or 3-stichous, simple, elongate leaves.

1. **F. insignis,** Bl.—An evergreen, lofty, scandent, little branched shrub, all parts glabrous; leaves 3-stichous, 1½-3 ft. long by ⅔-1 in. broad, long-sheathing at the base, acuminate, spinulose-serrate on the margins and on the midrib beneath, coriaceous, glossy; spadices 2-3, erect, peduncled, usually terminal, protected by as many red spathes, the outer spathes more green and passing into leaves; ovaries surrounded by a few sterile stamens; stigmas 2-3, sessile, almost horse-shoe-shaped; syncarps on an 1-1½ in. long peduncle, by 3 or 2, elongate-oblong, 2-4 in. long, fleshy, green, the berries free at the conical 3-5-cornered apex; stigmas 3-1, horse-shoe-shaped.

Hab.—Not unfrequent in the tropical forests of the Andamans.—Fr. Feb.-March.—s.—SS.=Metam. SiS., etc.

PALMÆ.

Flowers hermaphrodite, unisexual or polygamous. Perianth double, each of 3 segments dry, in 2 distinct series, imbricate or valvate in bud. Stamens 6, or rarely more, or 3 only; anthers versatile, 2-celled. Ovary usually consisting of 3 carpels, free or united in a 3-celled ovary, with a solitary or rarely 2 erect ovules in each carpel or cell; stigmas 3, usually sessile, undivided. Fruit either a 3- or 1-celled drupe or berry, or consisting of 3 distinct drupes or berries either all developed or 1 or 2 of them aborted, the pericarp smooth or variously rough, or retrorsely scaled. Seed erect or laterally attached. Albumen first milky, then indurating and horny or bony, homogeneous or ruminate, solid or hollow in the centre or outside. Embryo small, in a cavity near the outside of the albumen.—Simple or soboliferous trees, erect or decumbent, very rarely branched, or lofty scandent shrubs. Leaves usually very large, usually crowded at the summit of the trunk, or alternate, folded in the bud, pinnately or palmately divided, rarely simple, the petioles more or less sheathing. Flowers comparatively small, usually sessile, in simple or panicled spikes, enclosed when young in several or rarely in single sheathing bracts called spathes, and usually with 3 small bractlets under each flower.

A large noble family, which yields wine, oil, wax, sago, flour, dragon's-blood, sugar, fibre, utensils, weapons, food and habitations. The cocoa, date, betel-nut, palmyra, rattan, etc., are well-known examples. The enumeration of the various economical uses of palms would take some pages. In spite of their economical value they are comparatively of little value to the forester, the

rattans excepted. The wood is coarse and perishable, although elastic.

* *Fruit covered with retrorsely imbricate scales or bristles. Seeds often arillate.*

× Flowers spirally arranged, forming a more or less dense cylindrical catkin-like spike.

Albumen homogeneous; stemless or almost stemless erect palms. *Zalacca.*

Albumen ruminate; scandent palms . . . . . *Korthalsia.*

×× Flowers distichous (very rarely spuriously unilateral); scandent, often lofty, palms, very rarely erect.

Flowers solitary in the spathules, forming panicles . . . *Calamus.*

Flowers in small naked racemes or spikes hidden by the distichously imbricate spathes and arranged in long tail-shaped panicled catkins . . . . . *Plectocomia.*

* * *Fruits not scaly, smooth or variously tubercled reticulate or roughish. Seeds without arillus.*

× Leaves fan-shaped. Perianth in both sexes complete.

\+ Carpels apocarpous or united at the apex or with their styles, usually one only of them coming to perfection.

○ Inflorence terminal; corolla consisting of 3 free petals.

Flowers hermaphrodite, clustered; stamens hypogynous; drupe corticate; pinnæ united into a blade; erect palms, dying off after flowering . . . . . *Caryota.*

○○ Inflorescence axillary; corolla 3-parted; drupe sappy.

Flowers hermaphrodite, clustered; stamens perigynous; albumen with a cavity filled with the intruding integuments; pinnæ connate in a blade . . . . . *Livistona.*

Flowers polygamous, several together; stamens hypogynous; albumen with a longitudinal furrow; pinnae united into a blade. Erect palms . . . . . *Chamaerhops.*

Flowers hermaphrodite, solitary or by 2 or 3; stamens perigynous, the filaments inserted at the throat and united in a ring; pinnæ free, or by 2 or more united into broader or narrower flabellate segments . . . . . *Licuala.*

\+\+ Carpels syncarpous, the ovary 2-4-celled, with as many ovules; drupes 2-4-celled, with as many seeds.

Spathes incomplete, several; corolla imbricate in bud; drupe large, fleshy-fibrous; seeds soapy, with an apical pore; pinnæ united into a blade; erect palms . . . . . *Borassus.*

×× Leaves pinnate or twice pinnate or pinnatisect, rarely almost entire; perianth complete in both sexes.

\+ Carpels 3, distinct.

Dioecious; spathes 1 or 2, boat-shaped; corolla in males valvate, in the females imbricate; drupes sappy, single; albumen homogeneous; lower pinnæ spiny reduced; erect palms . . *Phœnix.*

\+\+ Ovary syncarpous, 3-celled, with as many ovules.

○ Spathes several, tubular or sheathing, persistent; pinnæ of leaves often fascicled, jagged or erose-toothed; erect palms.

† Leaves bipinnate.

Flowers monoecious on the same spadix; stamens indefinite; petals in females imbricate in bud; drupe sappy; albumen ruminate *Caryota.*

†† Leaves simply pinnate; petals in females valvate.

Flowers monoecious on different spadices, rarely dioecious; ovary 2-celled; stamens often definite; drupe sappy; albumen homogeneous . . . . . *Wallichia.*

Flowers monoecious on different spadices; stamens indefinite; ovary 3-celled; drupe depressed 3-angular, rather dry; albumen homogeneous . . . . . *Arenga.*

○○ Spathes 1 or 2, boat or spindle-shaped, deciduous; leaves simply pinnate, the pinnæ solitary, never fascicled; erect palms.

† Spathes boat-shaped; putamen not perforated; albumen solid, homogeneous or ruminate.

Flowers monoecious, immersed in the cavities of the rachis; stamens indefinite; stigma 1; albumen ruminate; pinnæ irregularly united into broader or narrower segments, rarely all united into a 2-cleft blade . . . . . *Pinanga.*

Very like the former, but stamens 6 or 3; stigmas 3; female flowers lateral between the ramifications, rarely axillary . *Areca.*

†† Spathe spindle-shaped or clavate; putamen at the base 3-porous; albumen hollow.

Monoecious on the same spadix; petals in females imbricate-convolute; ovary 3-celled, only one of the cells ovule-bearing; drupe large, woody; albumen homogeneous . . . . *Cocos.*

××× Perianth of females reduced to a few scales; carpels 3, apocarpous; male flowers in separate spadices surrounding the central solitary female-head; leaves pinnate.

Spathes many, sheathing, persistent; male perianth 6-parted, valvate in bud; stamens united by threes; drupes woody, angular-turbinate, in a large dense head; albumen homogeneous, hollow . . . . . *Nipa.*

ZALACCA, Rumph.

Flowers dioecious or polygamously monoecious, in a branched often elongate spadix. Spathes several or many, more or less lanceolate and slit to the base, the partial ones each enclosing a more or less terete catkin. Male flowers solitary or by pairs, bracteoled within the small spathaceous-connate spathules; bractlets bearded. Calyx 3-cleft or 3-parted. Corolla 3-parted, tubular. Stamens 6, the filaments connate at the base; anthers linear, sagittate. Female flowers solitary within the small spathule, and enclosed by 2 boat-shaped-connate bractlets. Calyx as in males. Corolla 3-parted, tubular. Sterile stamens 6, united in a hypogynous cup. Ovary 3-celled, with a solitary erect ovule in each cell; stigmas 3, almost sessile. Drupe covered with retrorse, imbricate, rigid scales, almost 1-celled through maceration of the cell-walls, 1-3-seeded. Seeds with a dense fleshy arillus. Albumen homogeneous, horny, the testa deeply penetrating and forming a central cavity. Embryo basilar.—Almost stemless soboliferous palms, with pinnate leaves without tendrils, the petiole, rachis, and sheaths armed with sharp spines, the pinnules often fascicled.

1. **Z. Wallichiana**, Mart.—*Yingan.*—An evergreen, large,

tufted, stemless or almost stemless palm 12-20 ft. high or somewhat higher, all parts glabrous; leaves 15-20 ft. long, pinnate, the petiole 8-10 ft. long, sheathing at the base, fearfully armed with 1-1½ in. long, flat, sharp, somewhat reflexed spines arranged in broken spirals, the rachis similarly armed, but the spines becoming gradually solitary towards the upper part; pinnæ by 5-2, approximated and alternate, broad-lanceolate, 3-ribbed, 2-3 ft. long, distantly spinulose-ciliate, green on both sides, subulate and almost tendril-like acuminate, the upper pinnæ confluent, 2-cleft, with as many lobes as pinnæ united; flowers small, rose-coloured, in short, cylindrical, pale rose-coloured, villous spikes, about 3 or more times shorter than the narrow, variously ruptured, partial spathes, and forming an elongate fastigiate-branched spadix, the rachis densely but shortly brown-scurfy, the lanceolate or linear-lanceolate spathes less so; flower-spathlets terminated by a dense tuft of rose-coloured paleaceous hairs; calyx divided to the base, the sepals obovate-oblong, about 1¼ lin. long; corolla nearly twice as long, rigid, rose-coloured; drupes in dense heads, obovoid, apiculate or almost acuminate, an inch long or longer, densely retrorsely scaled, 3-1-celled with as many arillate seeds, the scales brown, rather rigid, cordate-ovate, only the upper parts exposed and terminating in a reflexed brittle bristle up to 1½ lin. long.

Hab.—Frequent in the tropical forests all over Pegu and Martaban down to Tenasserim.—Fl. C.S.; Fr. June-July.—s.—SS.=Metam. SiS., etc.

KORTHALSIA, Bl.

Flowers dioecious, solitary within a scale-like bract and embraced by 2 bractlets united in a cup, forming a more or less terete tomentose or glabrous catkin or spike. Spathes many, tubular. Males: calyx 3-cleft. Corolla deeply 3-parted, not tubular. Stamens 6, filaments cohering at the base; anthers linear, almost dorsifix. Ovary-rudiment present. Females: calyx as in males. Corolla shortly tubular, 3-cleft. Staminodes 6 or more, united in a ring inserted to the throat of the corolla; anthers sterile. Ovary 1-celled with 3 ovules, or 3-celled, with a solitary ovule in each cell, of which only 1 comes to perfection; style long; stigmas 3, short, connate. Drupes 1-seeded, densely covered with rigid, imbricate, retrorse scales. Seeds arillate (?) Albumen ruminate, horny, perpendicularly excavate. Embryo ventral.—Scandent rattan-like palms often armed with pinnate leaves, the rachis terminated in an armed tendril. Drupes usually small.

Spines on the petioles almost straight, 3 to 4 lin. long; drupes obovoid, ⅛ in. long . . . . . *K. scaphigera.*
Spines on the petioles short, reflexed; drupes turbinate (globular), the size of a small pea . . . . . *K. laciniosa.*

1. **K. scaphigera,** Mart.—An evergreen large scandent rattan palm, the canes up to ½ an in. in diameter, the young leaves beneath fugaceously white-tomentose; leaves pinnate, 2-4 ft. long, the rachis sparingly armed with short, simple, sharp, retrorse spines and terminating in a long recurved-thorny tendril, the petiole ½-2 ft. long, irregularly beset with thin, sharp, 2-4 lin. long rather straight spines, the sheaths minutely brown-scurfy (in young plants sparingly prickly), dissolving along their margins into fibres embracing the stem; pinnæ at base contracted in a compressed petiolule, alternately somewhat approximated, plaited, broadly rhomboid-ovate, the upper ones cuneate-rhomboid, acuminate, about from the middle irregularly and sharply erose-toothed (the teeth formed by the more or less subulate-excurrent veinlets), many-nerved, 4-7 in. long, the terminal segment much broader; spadices long and pendulous, terminal, the tubular spathes (in fruit) smooth, brown; catkins very compact and terete, on a short sheathed peduncle, densely tawny-tomentose, 3-4 in. long, about 4 lin. thick; bracts very broad, rounded or almost acute, smooth, a little longer than the densely villous bracteoles; female calyx rigid, more than ½ lin. long, fibrous-ciliate; corolla nearly 2 lin. long, very rigid-coriaceous, deeply 3-cleft, the tube very short; drupes obovoid, mucronate, ½ in. long, retrorsely imbricate-scaled, 1-seeded; scales rigid, trapezoid-ovate, longitudinally impressed, greenish, towards the apex brownish, bordered by a pale brown, broadly lacerate, narrow, bluntish membrane.

Hab.—Common all over the Andamans, especially in the tropical forests.—Fr. H.S.

2. **K. laciniosa,** Mart.—An evergreen large scandent rattan palm, the young leaves beneath covered with a short, white, very dense, very fugaceous tomentum; leaves pinnate, the rachis terminating in a prickly tendril, petiole armed with scattered, hooked, short thorns, white, with a dark point, sheaths usually fibrous-dissolving, armed with a few short straight spines and fugaceously greyish-tomentose; pinnæ rhomboid to cuneate-rhomboid, contracted in a compressed petiolule, 4-8 in. long, acuminate, many-nerved, irregularly sharply and often bristly erose-toothed from about the middle; spadix much branched, the main rachis covered with tubular smooth spathes; catkins terete, 3-3½ in. long by 3-4 lin. thick, rusty-brown, woolly; bracts broad and rounded; bractlets converted into a rusty-brown wool; calyx short, broadly 3-toothed; corolla deeply 3-cleft, exserted, smooth, rigidly coriaceous; ovary covered with toothed scales; drupes turbinate, apiculate, the size of a small pea; scales greenish, with brownish margins.

Hab.—Tenasserim, from the Salween down to Mergui.—Fr. March.

PLECTOCOMIA, Bl.

Flowers dioecious, bracteoled, hidden by the dichotomously arranged scale-shaped spathules, forming a branched spadix with numerous incomplete spathes along the main rachis. Males in simple spikes, by pairs. Calyx more or less cup-shaped, 3-lobed or -toothed. Corolla 3-parted. Stamens 6; filaments subulate, connate at the base; anthers linear, almost basifix. Ovary-rudiment none. Females in almost branched spikes, solitary. Calyx as in males. Corolla deeply 3-cleft. Sterile stamens 6, united in a cup. Ovary 3-celled, only one of the cells fertile; stigmas 3, filiform, united at the base. Drupes densely covered with reflexed imbricate shining scales, 1-seeded. Albumen homogeneous, wrinkled outside. Embryo basilar.—Lofty scandent palms, with pinnate leaves, the rachis terminating into a whip-like recurved-thorny tendril.

1. **P. macrostachya,** Kz.—An evergreen lofty climber, all parts glabrous; leaves pinnate, the petiole and rachis spiny, the spines straight, up to ⅓ in. long; pinnæ (median ones) somewhat approximate by pairs, linear-lanceolate, ½-2 ft. long, long-acuminate, white-powdery beneath, 3-ribbed (2 of the ribs marginal), coriaceous, but rather flaccid; spadices not seen; lateral spikes 4-5 ft. long, about 2 in. thick, somewhat compressed, pendulous; spathules distichous, rhomboid-obovoid, acute, 1½ to nearly 2 in. long, coriaceous, brown, blackish towards the upper borders, glabrous; male spikelets as long as the spathules, rusty-scurfy-strigillose, the rachis rather strong, shortly and distichously branched; female flowers not seen. Male flowers: calyx wide, cup-shaped, about a line deep, shortly 3-toothed, the teeth acute, bordered, especially in their sinuses, by a dense brown woolly tomentum; petals rigid, falcate, lanceolate, sharply acuminate, about ⅓ in. long or somewhat longer, sulcate outside; stamens 6; drupes unknown.

Hab.—Tenasserim, on the Bithoko range, at 3,000 ft. elevation.

CALAMUS, L.

Flowers polygamously dioecious, solitary within the spathules, and forming an erect or drooping branched spadix. Spathes numerous or several, the outer ones complete or incomplete, those of the branchings gradually smaller and passing into spathules, persistent or deciduous. Calyx 3-toothed or -cleft. Corolla 3-cleft or deeply 3-parted. Male flowers sessile, usually supported by 2 bractlets united in a cup. Stamens 6; filaments cohering

at the base, usually infracted at the apex; anthers linear, erect. Ovary-rudiment none or present. Female flowers supported by 2 similar cup-like connate or free bractlets and usually accompanied by an asexual flower, sessile or pedicelled. Sterile stamens united in a cup. Ovary incompletely 3-celled; stigmas 3, subulate, free or united at the base. Drupe covered with retrorsely imbricate scales, 1-seeded. Seed arillate. Albumen homogeneous, porous or otherwise sculptured outside, or ruminate. Embryo almost oblique and basal.—Large scandent, rarely erect shrubs or soboliferous trees, more or less armed, with pinnate leaves often terminating in a retrorsely thorny tendril. Inflorescences elongate or short, erect or drooping, either spuriously axillary (arising from near the base of the sheath of the succeeding leaf) or leaf-opposite arising from near the apex of the sheath in front of the leaf itself. Arillus watery, white or pale rose-coloured, often edible.

* *Flowers usually sessile; spathes persistent, all tubular or flattened out from a tubular base; albumen usually homogeneous.*

† Drupes sessile, *i. e.*, the perianth more or less spreading and adhering to the base of the fruit. Spathules of the spikes much imbricated, the exserted part cymbiform, shorter than broad, more or less truncate.

○ Scales of fruit without a conspicuous appendage.

△ Pinnæ equidistant; no leaf-tendrils.

Erect, tufted; pinnæ white beneath; no tendrils whatever . . *C. arborescens.*

Erect, tufted; leaves uniformly green, without (but the sheaths and spadices with) tendrils . . . . . *C. erectus.*

△ △ Pinnæ fascicled or interruptly approximate.

Young stems, &c., whitish powdery; leaves without tendrils; pinnæ interruptly fascicled; drupes globular, straw-coloured . *C. fasciculatus.*

Glabrous; leaves tendril-bearing; pinnæ broad, alternately approximate; drupes oblong, brown . . . . . *C. latifolius.*

○ ○ Scales of fruits produced in a fringed appendage as long or longer than the crustaceous scale itself.

Leaves tendril-bearing; inflorescence without tendrils; drupes ½ in. long, straw-coloured . . . . . *C. Andamanicus.*

Leaves without tendrils; inflorescence with tendrils; drupes an inch long or somewhat longer, dark and pale brown variegated . . . . . *C. tigrinus.*

† † Drupes seated on the erect, indurated, thick, pedicel-like perianth; spathules usually long-exserted and tubular, rarely cymbiform and imbricate, usually not truncate.

○ Spathules imbricate, broader than long, truncate.

Leaves without tendrils; pinnæ equidistant; drupes globular, ⅓ in. thick, straw-coloured . . . . . *C. tenuis.*

○ ○ Spathules exserted and rather elongate.

× Spathes with a short acute limb only.

Leaves not tendril-bearing; pinnæ interruptly-approximate; drupes ellipsoid, straw-coloured, nearly an inch long . . . *C. gracilis.*

Leaves not tendril-bearing; pinnæ equidistant, narrow; spathes green, very thin, compressed-tubular, almost unarmed . . *C. Helferianus.*

Leaves tendril-bearing; pinnæ distant, alternately approximate; male flowers in recurved small spikelets or fascicles exserted from the spathules . . . . . *C. paradoxus.*

× × Lower spathes expanded in a flat elongate limb, only at the short base tubular.

Leaves not tendril-bearing; pinnæ narrow, equidistant; drupes globular, the size of a pea, the scales straw-coloured with blackish-brown borders . . . . . *C. Guruba.*

* * *Flowers usually pedicelled; spathes deciduous, the outer one boat-shaped and large; albumen usually ruminate.*

† Spathes unarmed or nearly so.

Leaves not tendril-bearing; pinnæ interruptly-approximate, white beneath . . . . . *C. hypoleucus.*

† † Spathes (at least the outermost one) much armed with thorns or spines.

Leaves uniformly green; sheaths and spathes outside fearfully armed with flat, glossy, black spines; drupes globular, the size of a cherry . . . . . *C. grandis.*

1. **C. arborescens,** Griff.—*Danoung.*—An evergreen, stoloniferous, gregarious, erect palm (15—20+8—12+½—1), much armed, all parts glabrous, the stems jointed, green, smooth and glossy; leaves not flagelliferous, pinnate, 6-8 ft. long, the petiole and the long sheaths fearfully armed with whorls of blackish or brownish broad sharp spines about an inch long, the rachis fugaceously whitish scurfy beneath, armed with similar spines as the petiole, but these are by 7-5 and upwards, decreasing in number and becoming solitary towards the extremities; pinnæ nearly opposite or the upper ones alternate, linear-lanceolate, up to 1½-2 ft. long, terminating in a bristly-ciliate cirrhose acumen, transversely veined, dark-green and glossy above, white below, bristly-ciliate along the borders and often also along the 2 lateral nerves, while the midrib often shows longer, black, subulate, distant spines, the 2 end-pinnæ connate to about their middle or higher up; spadices elongate, drooping, compound; spathes tubular-club-shaped with split erect limbs often lacerate and blackened, the lower ones armed with copious, seriately disposed, blackish, reflexed, flat spines, the upper smaller ones quite unarmed; spathules of the slender distichous spikes densely imbricate, almost cymbiform-tubular and short, truncate; calyx cup-shaped, shortly 3-lobed, about a line long; corolla-lobes 2½ lin. long, oblong, concave, somewhat acute, rigidly coriaceous; drupes ovoid, ½-⅔ in. long, apiculate, supported by the coriaceous somewhat enlarged perianth, 1-seeded; scales uniformly brown, with a very narrow, whitish, minutely erose margin, cordate-trapezoid, rounded at the apex, almost biconvex from a longitudinal furrow.

Hab.—Common in marshy beds of choungs in the moister mixed, and tropical forests of Pegu.—Fr. C.S.—s.—SS.=*SiS.* All.

2. **C. erectus,** Roxb.—*Theing.*—An evergreen, low, erect, tufted

palm, looking like *Zalacca*, 12-18 ft. high, all parts glabrous; leaves 18-12 ft. long, pinnate, without tendril, the petiole as also the sheaths armed with seriate, up to an inch long, greenish or fuscous, flat, sharp spines, the rachis armed similarly, but the spines gradually becoming fewer in number towards the apex; pinnæ by 5 or fewer alternately approximate, elongate-linear-lanceolate, glossy, green on both sides, many-nerved and transversely veined, acuminate, spinulose-ciliate, 1½-2 ft. long by 1½-2 in. broad, the midrib beneath armed with distant capillary bristles; spadices elongate, branched, terminating in a whip-like recurved-thorny tendril; spathes somewhat compressed, linear-tubular, acuminate, armed with half-whorls of flat upwards and downwards directed spines up to ½ in. long, the partial spathes unarmed, shaped and rupturing like those of *Zalacca;* spathules imbricate, cymbiform, almost truncate, glabrescent, fibrous-dissolving at their long extremity; flowers distichous; calyx a little longer than the bract, shortly 3-toothed; corolla nearly 3 times longer, the tube narrow, nearly as long as the calyx, the lobes linear-oblong; stamens in males free, the filaments broad, not infracted, shorter than the anther; drupes more than an inch long, ovoid-oblong, apiculate, glossy, brown, 1-seeded; scales imbricate, cordate-trapezoid, fuscous, towards the base paler-coloured, almost biconvex with a rather broad longitudinal central furrow, bluntish, the margins not bordered and almost entire; seed oblong, somewhat compressed, the albumen foraminate-erose, surrounded by a resinous crust.

Hab.—Evergreen tropical forests of Chittagong and Pegu.—Fr. C.S.—s.—SS.=SiS.

3. **C. fasciculatus,** Roxb.—*Kyeing-kha.*—An evergreen, lofty, scandent rattan palm, erect and tufted while young or in sunny situations, all the younger parts and sheaths covered with a white powder, the sheathed stems about 1-1½ in. thick, the canes only half so thick; leaves pinnate, not tendril-bearing, 3-5 ft. long, the petioles short or long, often saccate at the base, and, like the rachis and sheaths, covered with a white, powdery, fugaceous tomentum, armed with ½-1½ long solitary to ternary variously directed straight, sharp spines, the sheaths armed with alternating whorled (by 7-9 or more) or simple spines, which are flat, spreading, greenish brown, ½-1 in. long; pinnæ by 2 or 3 in distant fascicles, elongate-linear-oblong to narrow linear, acuminate, bristly ciliate, and above furnished with similar bristles along the principal lateral and (with much stronger ones) along the midrib; spadix arising from the front of the sheath, elongate, drooping, glabrous, terminating in a long whip-like recurved-thorny tendril; spathes elongate-linear-tubular, green, shortly acuminate at the apex, armed with recurved, solitary to ternary, short, sharp thorns, the partial

spathes shorter, tubular, and unarmed; spathules similarly shaped, but small, not imbricate; male flowers in very short, curved, distichous spikelets, exserted from the spathules; bracts ovate, acute, adnate, almost reflexed; male flowers minute, only about a line long; corolla about twice as long as the calyx; stamens inserted at the mouth of the corolla-tube; drupes globular, sessile with the persistent perianth, from the size of a pepper-kernel to that of a large pea, straw-coloured, apiculate; scales trapezoid, narrowly bordered, uniformly straw-coloured, with a bluntish pale-brown point, slightly biconvex from a longitudinal furrow; seeds depressed-globular, irregularly and deeply grooved-wrinkled.

Hab.—Frequent in the mixed forests, especially the lower ones, all over Burma from Ava and Chittagong down to Tenasserim and Andaman islands.—Fl. Sept.-Oct.; Fr. Apr.-May.—l.—SS.=SiS. All., etc.

Remarks.—The rattan thin, but strong; used for cordage, basket-work, etc.

4. **C. latifolius,** Roxb.—*Ya-ma-ta.*—An evergreen, extensive, scandent rattan palm, all parts glabrous, the sheathed stems 2-3 in. in diameter, the canes up to an inch thick; leaves 8-12 ft. long, pinnate, terminating in a long, whip-like, retrorse-thorned tendril, the short petiole armed with a double or single row of short, more or less sharp spines, hollowed out at inner base, saccate at base (the sac unarmed or sparingly and shortly prickly), the sheaths quite green, beset with a few excavate thorn-like protuberances or seriate, large, excavate, flat, sharp spines or occasionally quite or nearly quite unarmed (on the same plant), sometimes the spines short, flat and black; the rachis armed with fascicled or upwards simple recurved strong thorns; pinnæ alternate, broad-lanceolate, the median ones alternately approximate by twos, 1-2 ft. long by 3-5 in. broad, bristly ciliate towards the shortly acuminate apex, many-nerved and transversely veined, uniformly green; spadix bifariously decompound, axillary, elongate, drooping; spathes tubular, with an obliquely truncate acuminate limb, glabrous, sparingly recurved-thorny, the partial spathes conform, but not so small and less armed; spathules cymbiform, the outer margin acuminate-produced, glabrous; male flowers greenish yellow; ovary-rudiment small, 3-lobed; drupes ellipsoid-oblong, rather glossy, apiculate, about ½ in. long, supported by the persistent rigid perianth; scales trapezoid, bluntish, slightly biconvex, with a faint longitudinal furrow, pale brown, with a narrow blackish-brown margin; seeds almost half convex, grooved and irregularly wrinkled.

Hab.—In the evergreen tropical forests all over Burma from Chittagong, Pegu, and Martaban down to Tenasserim and the Andaman Islands.—Fr. Apr.-May.—s: l.—SS.=SiS. Metam., etc.

Remarks.—The rattans very strong and good, used for ropes, walking-sticks, basket-work, etc., in the same way as those of the following species.

5. **C. Andamanicus,** Kz.—An evergreen, lofty, scandent rattan palm, the sheathed stems as thick as the arm, the canes up to an inch in diameter, all parts almost glabrous; leaves pinnate, terminating in a whip-like recurved-thorny tendril, 6-8 ft. long, the petioles saccate at base, armed with short, blackish, thin thorns arising from tubercle-like swellings intermixed with a few long black spines; the reddish-brown sheaths covered with numerous obliquely placed seriate whorls of capillary black spines, which soon break off and leave only their bases, towards the fugaceously greyish-tomentose base furnished with reflexed, broader, flat, black spines up to nearly an inch long and forming stronger combs; the rachis more or less depressed 5-gonous, armed beneath with reflexed paired or ternary thorns, towards the petiole also distantly short thorned on the margins; pinnæ solitary, alternate, equidistant, 2-2½ ft. long and up to an inch broad, linear, subulate-acuminate, on the margins and on the 3 principal nerves beneath distantly capillary spiny, transversely veined, uniformly green; spadix axillary, ample, decompound, nodding; spathes somewhat compressed-tubular, armed with strong, short, reflexed solitary to ternary black thorns, otherwise apparently glabrous; the partial ones unarmed, tubular, and slit on one side, rather abruptly acuminate, glabrous; spathules tubular-cymbiform, closely imbricated, truncate, glabrous; flowers...; drupes distichous, numerous, supported by the somewhat enlarged perianth, globose-ovoid, terminating in a brown-scaled point, about ½ in. long; scales trapezoid, crustaceous, glossy, straw-coloured chestnut-brown bordered, rather flat and without furrow, at apex prolongated into a lanceolate, pale brown, opaque, acute, ciliolate, membranous appendage as long as or longer than the scale itself; seed half-convex, grooved; albumen homogeneous.

Hab.—Common in the forests all over the Andaman.—Fr. H.S.—s.—SS.= SiS. Metam., etc.

6. **C. tigrinus,** Kz.—An evergreen, large, scandent rattan, all parts glabrous, the canes up to an inch in thickness; leaves pinnate, 4-8 ft. long, without tendril; the sheaths fearfully armed with whorls and half-whorls of an inch long, broad, flat, sharp, glossy, fuscous or black spines, variously intermixed with shorter or thinner ones, sending out from their front a long similarly armed, further up recurved, connate, thorny whip-like tendril; the petiole and lower parts of rachis similarly but less densely armed not only on the back but also along its margins; pinnæ linear, the lower ones approximate by 2 or 3, alternate or nearly so, 1½-2 ft. long, many-nerved and transversely veined, acuminate, spinulose-ciliate, green on both sides, the midrib above and usually also the lateral nerves beneath distantly capillary-spiny, the 2 end-pinnæ more or

less connate, deeply 2-cleft; spadix ample, decompound, nodding, tendril-bearing; spathes compressed linear-tubular, densely black-spiny, the partial spathes unarmed, tubular, and much lacerating at apex; spathules tubular-cymbiform, densely imbricate, truncate, minutely brown-scurfy, the one side more produced and often lacerating; flowers...; drupes ovoid-oblong, acuminate, about an inch long, black and brown variegated, 1-seeded, supported by the scarcely enlarged perianth; scales much imbricated, trapezoid, not furrowed on the crustaceous, glossy, pale brown, rather flat back, rather broadly black-bordered and produced in a large, pale brown, minutely lacerate, membranous, rather acute appendage; seed oblong, broadly and longitudinally ribbed.

Hab.—Common in the evergreen tropical forests from the eastern slopes of the Pegu Yomah and Martaban down to Tenasserim and the Andamans.—Fr. H.S.—s : l.—SS.=SiS. Metam., etc.

7. **C. tenuis,** Roxb.—An evergreen extensively scandent rattan palm, all parts glabrous, the sheathed stems as thick as the finger, the canes themselves not thicker than a common quill; leaves pinnate, without tendril, 1½-2 ft. long or longer, the petiole short, armed along the margin with straight, and on the back with hooked thorns, often saccate at the base, the rachis similarly armed to the petiole, the thorns becoming solitary further up; the sheaths green, glabrous, distantly armed with short, flat and broad, excavate sharp thorns of various size, sending out from their front a recurved-thorny whip-like tendril; pinnæ all equidistant, alternate, linear-lanceolate, 10-12 in. long, acuminate, bristly ciliate and above furnished with capillary bristles on the 3 principal nerves, uniformly green; spadix arising from the front of the sheath, elongate, terminating in a whip-like recurved-thorny tendril, glabrous; spathes elongate-tubular, with an obliquely acute short limb, green, slightly fugaceous-scurfy, armed with short, scattered, recurved sharp thorns, the partial ones unarmed, scurfy, short, fimbriate at the point; spathules very short, cymbiform, truncate, densely crowded and small; flowers small, distichous, about a line long, the males and hermaphrodites in alternate pairs; drupes almost ellipsoid-globular, seated on the pedicel-shaped indurated perianth, apiculate, nearly ½ in. long, straw-coloured; scales rhomboid, uniformly straw-coloured, with a narrow whitish border, acute, almost flat, with a distinct longitudinal furrow.

Hab.—Chittagong; also Pegu.—Fl. R.S.; Fr. Apr.

8. **C. gracilis,** Roxb.—An evergreen, slender, scandent rattan palm, all parts glabrous, the sheathed stems as thick as the finger, the canes only as thick as the common quill; leaves 2-3 ft. long, pinnate, without tendril the petiole very short, and, like the rachis,

fugaceously brown-scurfy and armed below with a single row of short, sharp, recurved blackish thorns; the sheaths green, glabrous, sparingly and shortly thorny, sending out from their front a long whip-like recurved-thorny tendril or the inflorescence; pinnæ by 5-2 interruptly approximate, 5-7 in. long, 3-7-nerved and transversely veined, above bristly on the 3 or 5 principal nerves, very long and bristly acuminate, entire or inconspicuously bristly-ciliate; spadices arising from the front of the sheath, drooping, elongate and slender, terminating in a recurved thorny tendril; spathes tubular, with an acuminate limb, glabrous, sparingly recurved-thorny, green, the partial spathes short-tubular, acuminate, unarmed; spathules almost conform to the spathes, but smaller, not imbricate; calyx cupular, 3-toothed; corolla 3-lobed, 3 times longer than the calyx, the base thick fleshy; stamens inserted at the mouth of the corolla; ovary-rudiment 3-toothed; drupes $\frac{3}{4}$ in. long-elliptical to elliptically globular, apiculate, supported by the indurated stalk-like perianth, straw-coloured; scales trapezoid, bluntish, straw-coloured, with a very narrow brownish margin, slightly biconvex with a very deep longitudinal furrow; seed irregularly wrinkled.

Hab.—Forests of Chittagong.—Fr. March.

9. **C. Helferianus,** Kz.—Evidently a slender scandent rattan somewhat of the habit of *C. viminalis,* all parts glabrous; leaves pinnate, without tendril, the rachis thin, 3-gonous, along the convex back sparingly armed with small, recurved solitary thorns; pinnæ narrow-linear, alternately approximated by 2-4, long—acuminate, 6-8 in. long, towards the apex bristly ciliate, on the 2 lateral nerves above bristly and slightly so also along the midrib beneath; spadix elongate, very slender, glabrous; spathes elongate-linear-tubular, compressed, green, sparingly recurved-thorny on the edges, the upper ones unarmed, the limb linear-acuminate, erect, the partial spathes shorter and truncate; spathules minute, cymbiform, remote; male flowers distichous, about $1\frac{1}{2}$ lin. long; calyx cupular, shortly 3-toothed; corolla more than twice as long as the calyx, 3-cleft almost to the base, the lobes oblong, acute; stamens inserted at the base of the corolla; female flowers, etc., unknown.

Hab.—Tenasserim (or Andamans?).

10. **C. paradoxus,** Kz.—An evergreen, extensive, scandent rattan palm, all parts glabrous, the sheathed stems 1-2 in. in diameter; leaves pinnate, 5-7 ft. long, terminating in a whip-like hooked-thorny tendril, the petiole short, along with the lower part of the rachis indistinctly puberous and armed underneath and near both margins with more or less straight sharp thorns; the sheaths

armed with yellowish, sharp, flat spines arranged into combs ; pinnæ 1-1½ ft. long, up to an inch broad, of a thin texture, alternating by pairs and remote, marginate, shortly acuminate, inconspicuously and remotely appressed-ciliolate ; male spadix bifariously decompound, ample, drooping ; spathes all smooth, tubular, with a truncate shortly acuminate limb ; spathules similarly shaped, but much smaller, embracing the base of the very short (1-3 lin. long) distichously imbricate-bracted male spikelets ; bracts spreading, ovate, acute, about a line long, brown, glabrous ; male flowers : calyx about a line long, deeply 3-cleft, striate ; petals rigid, at base only connate, nearly 2½ line long, oblong, acute ; stamens 6, filaments rigid, the lower part linear-oblong, longer and broader than the anthers, terminating in an infracted thread, from which the anther is versatily suspended ; ovary-rudiment hardly any ; female flowers and fruits unknown.

Hab.—Martaban, in the evergreen tropical forests of Palawa zeik (Toukyeghat), east of Tounghoo.—Fl. Apr.—s.—SS.=Metam.

11. **C. guruba,** Mart.—*Kyeing-nee.*—An evergreen, extensive, slender, scandent rattan palm, all parts glabrous, the sheathed stems up to ½ an in. thick, the canes thin ; leaves pinnate, without tendril, 3-4 ft. long, the petiole long and slender, armed with long, recurved, sharp, brown thorns underneath, and with similar smaller ones along the margins, intermixed with minute conical thorns ; the sheaths sending out from the front a retrorse-thorny, long, whip-like tendril, green, covered with erect-patent, brown, flat spines of about ½-¾ in. length, crowdedly intermixed with smaller variously long ones ; the rachis while young rusty-puberous, armed with short-hooked solitary spines ; pinnæ regularly alternate, ½-1 ft. long, linear, bristly acuminate, minutely bristly ciliate, above on the 2 lateral nerves bristly and often so beneath on the midrib, uniformly green ; spadix slender, arising from the front of the sheaths, terminating in a retrorsely-thorny whip-like tendril, glabrous ; spathes glabrous, the basal one compressed-tubular, the limb up to a foot long and elongate linear-oblong, recurved-thorny on the midrib, the connate portion armed with long sharp spines along the sharp sides and with short recurved thorns on its back, the other spathes unarmed along the elongate limb or occasionally recurved-thorny on the outside just like the connate lower portion ; spathules small, shortly tubular, distant ; flowers small, about a line long, supported by a minute adnate bract, and forming small, distichous, alternating spikelets ; drupes globular, apiculate, the size of a small pea, almost sessile, with the spreading persistent perianth pedicel-like, indurating only at the base ; scales minute, rhomboid, almost flat, with a slight longitudinal furrow, straw-coloured, dark brown,

bordered towards the bluntish membranous and almost minutely lacerate pale-coloured point.

HAB.—Frequent in the mixed forests all over Burma from Chittagong and Ava down to Tenasserim.—Fl. C.S. ; Fr. May.—l.—SS.=SiS. All., etc.

12. **C. grandis,** Griff.—An evergreen, lofty, extensive, scandent rattan palm, the sheathed stems as thick as the arm, the canes up to an inch in diameter; leaves pinnate, terminating into a recurved-thorny tendril, 4-6 ft. long, the petiole short, saccate at the base, and here on the back armed with a few recurved short thorns and several blackish flat spines, further up (like the rachis) armed with paired or further up with ternary and quinary, recurved, strong, connate thorns black at the sharp points, above along both margins they are furnished with a row of small, short, erect thorns, becoming longer, sharper, and rather irregularly crowded and spread towards the base ; the sheaths covered with ½-¾ in. long, flat, sharp, black, recurved-spreading spines whorled into combs ; pinnæ regularly equidistant, alternate or nearly so, linear, acuminate, 1-2 ft. long, uniformly green, bristly-ciliate towards the apex, towards the base and on the lateral nerves above furnished with longer, black, capillary bristles ; spadix compound, erect, 1-1½ ft. long, protected by the outer 1 or 2 linear-oblong boat-shaped spathes covered with a fugaceous, brown, scurfy tomentum and armed with numerous clustered or almost combed flat spines of the size and shape of those on the sheaths ; partial spathes linear, ½-1 ft. long or shorter, unarmed ; drupes globular, apiculate, the size of a cherry, almost sessile, with a spreading appressed perianth, 1-seeded, often exuding dracon-blood from between the scales; scales trapezoid, with a bluntish apex, straw-coloured or pale brown with a darker coloured intramarginal zone and a whitish narrow margin, slightly biconvex and with a longitudinal furrow ; seeds somewhat depressed-globular, brown, even ; albumen ruminate.

HAB.—Rather frequent in the tropical forests of the Andamans.—Fr. May.—s.—SS. =SiS. Metam.

REMARKS.—Besides the canes, this yields also a good sort of dracon-blood, but only in small quantities.

13. **C. hypoleucus,** Kz.—Apparently a slender scandent rattan palm, the sheathed stems as thick as the finger, the canes as thick as a common quill ; leaves interruptedly pinnate, 2 -3 ft. long, without tendril, the petioles short, often saccate at base, armed with shorter and longer conical thorns on the back and along the margins where they are sparingly intermixed with somewhat recurved, straight, short spines, the reddish rachis similarly but more sparingly armed, upwards simply recurved spiny ; the sheaths armed like the petiole, but very densely so, with unequally long, straight, sharp, up to an

inch long or longer spines towards the mouth, in front sending out a long, prickly, recurved, thorny, whip-like tendril; pinnæ ½-¾ ft. long, alternately and interruptedly approximate, by twos on each side, oblong-lanceolate, acuminate, bristly ciliate towards the apex, white beneath, many-nerved; female spadix small, only ½ ft. long, on a slender about an inch long; peduncle thorny on both margins; spathes unarmed or occasionally with a minute prickle on the mid-rib, smooth, lanceolate-oblong, slit almost to the base; spathules shortly tubular with an acuminate limb, small and distant; female flowers minute, about a line long, distichous; calyx shortly 3-lobed, ½ lin. long; corolla twice as long with a short tube, the lobes linear-lanceolate, acute; male flowers and fruits unknown.

HAB.—Tenasserim, Thoungyeen.—Fl. March.

N. B.—Several other species of rattan occur in Burma and the adjacent islands, but cannot be taken up here on account of the incompleteness of the material at my disposal.

CORYPHA, L.

Flowers hermaphrodite, bracted, in a terminal, erect, many-sheathed panicle-like spadix. Calyx cup-shaped, 3-toothed; corolla 3-petalous, valvate in bud. Stamens 6, equal; filaments dilated and free or cohering at the base; anthers ovate. Ovaries 3, cohering, with a solitary anatropous ovule in each cell; styles subulate, connate into a 3-toothed column. Drupe usually solitary with the abortive ones at the base, rarely one or the other of the ovaries equally developed, 1-seeded, the mesocarp fleshy-fibrous. Albumen homogeneous, horny.—Lofty simple-stemmed palms, flowering but once and then dying. Leaves large, palmately flabellate, the petiole spiny-armed. Spadix an ample, erect, terminal panicle, with numerous primary and secondary spathes. Flowers small, clustered, sessile or nearly so.

* *Drupes the size of a wood-apple.*

Lofty palm, the trunk annular or smooth . . . . . *C. umbraculifera.*

** *Drupes the size of a cherry.*

Trunk spirally grooved. 60-70 ft. long; petioles 6-12 ft. long . *C. gebanga.*

Trunk 8-12 ft. long; petioles 18-25 ft. long . . . . *C. macropoda.*

1. **C. umbraculifera**, L.—*Pe-pen.*—An evergreen palm (30—80 +20—60+4—7), all parts quite glabrous, the trunk straight, annular or even (not spirally grooved); leaves ample, 8-12 ft. across each way, palmately flabellate, plaited, the petiole very strong and thick, 5-10 ft. long, on the margins armed with numerous, blackish, polished, short, compressed spines; pinnules united rather more than half way up, linear-lanceolate, acute; flowers small, greenish-white, almost pedicelled, clustered, forming rather slender,

curved, long spikes arranged in an immense compound panicle with large primary spathes which surround the erect very thick peduncle arising from the top of the trunk; calyx broadly 3-toothed, scarcely half a line long; petals about a line long, elliptically oblong; drupes almost globular, about 1-1½ in. in diameter, with 1 or 2 abortive ovaries at the base, greyish olive-coloured, roughish, 1-seeded.

Hab.—Frequently seen cultivated in villages all over the southern provinces of Burma.—Fl. H.S.; Fr. the following year.

Remarks.—Fans of enormous size are made of its leaves in Ceylon. The pith yields a sort of sago.

2. **C. gebanga,** Bl.—An evergreen palm (70—80+60—70+5—7), all parts quite glabrous, the trunk spirally ridged and furrowed, as if twisted; leaves spirally arranged, ample, 5-10 ft. across each way, palmately flabellate, plaited, the strong petiole 6-12 ft. long, armed with numerous, short, curved, compressed spines along the black polished margins; pinnules united to about their middle, linear, 2-cleft at the rather blunt apex; flowers small, yellowish or whitish, very shortly pedicelled, arranged in small clusters along the rather short and pretty robust branchings of the glabrous, immense, much branched, panicle-like, erect spadix arising from the summit of the trunk; peduncle covered with large primary spathes; calyx minute; petals about a line long; drupes globular, with 1 or 2 rudimentary ovaries at the base, the size of a cherry, smooth, olive-coloured, 1-seeded.

Hab.—Only occasionally seen in Burmese villages,—as, for instance, around Tounghoo.—Fl. H.S.; Fr. the following year.

Remarks.—The pith yields a sort of sago. Yields also fibre for fishing-nets and ropes.

3. **C. macropoda,** Kz.—An evergreen palm (30—40 + 8—12 + (?); leaves very ample, palmately flabellate, from 12-20 ft. across, the petiole towards the base as thick as an arm, straight and slender, from 18-25 ft. long, along the polished margin armed with strong, incurved, compressed, glossy black spines; pinnæ united to near the middle in a blade, 6-10 ft. long, linear, 2-lobed and bluntish at apex, the ribs 4-cornered; inflorescence and flowers unknown; drupes the size of a cherry, globular, with one or two small abortive ovaries at their base, smooth, olive-brown, 1-seeded.

Hab.—In the bamboo jungles of the western side of South Andaman.—l.—SS.=Metam.

LIVISTONA, R. Br.

Flowers hermaphrodite, sessile or shortly pedicelled. Spadix branched, protected by loose, ample, deeply-cleft spathes. Sepals

and petals almost conform, 3-lobed. Stamens 6, the filaments short and very much dilated, but hardly forming a continuous ring; anthers cordate-oblong. Carpels 3, cohering with the inner face, the style united in a column; stigmas acute, distinct or connate. Drupe solitary by abortion, globular to elliptical, 1-seeded; putamen thin, the mesocarp fleshy. Albumen horny, excavate in front. Embryo dorsal.—Simple-stemmed palms, with palmately flabellate leaves, all the pinnæ high up connate and forming a plaited blade deeply divided into 2-lobed segments; petioles often spiny-armed, the sheaths dissolving into netted fibres.

1. **L. speciosa,** Kz.—*Tau-htan.*—An evergreen lofty palm (50—70 + 40—60 + 3—5), all parts glabrous; leaves palmately flabellate, about 6-7 ft. across each way, plaited, the petiole at the base up to an inch broad, armed with strong, sharp, falcately curved, flattish, blackish spines, the lower spines up to ½ an in. long and longer by 3-4 lines broad at base, the sheaths dividing into netted fibres; pinnæ all (the lateral ones up to half of their length, the central ones higher up) connate in a blade, linear, sharply 2-cleft at apex, the ribs compressed, prominent, the veins rather visible and transverse; flowers small, solitary or by 2 on a nipple-like very short and thick pedicel, racemose-spicate, forming a much branched, smooth, panicle-shaped, 2-4 ft. long spadix, furnished at the base and along the primary axis with large, fuscous, quite smooth spathes; sepals and petals hardly a line long; drupes elliptically obovoid, ⅔ to nearly an in. long, dark blue, smooth, 1-seeded, seated on the short, thick, indurated perianth jointed with the nipple- or disk-shaped very short peduncle.

Hab.—Frequent in the evergreen tropical forests of the eastern and southern slopes of the Pegu Yomah; Upper Tenasserim (Brandis).—Fr. March-Apr.—s.—SS. = SiS.

CHAMÆROPS, L.

Flowers polygamously dioecious or monoecious, sessile, bracted. Spadix surrounded by 2-4 spathes. Male and hermaphrodite perianth conform; calyx 3-parted; corolla 3-petalous. Stamens 6-9, the filaments connate at the base; anthers ovate or oblong. Ovaries 3, rarely more, distinct; stigmas subulate, almost sessile. Drupes by threes, sometimes fewer by abortion, 1-seeded. Albumen ruminate or homogeneous, hollow in front. Embryo dorsal.—Large or small simple-stemmed, rarely almost stemless palms, with palmately lobed leaves, all the pinnæ high up connate, forming a many-lobed plaited blade with the segments 2-lobed at the apex; the petioles more or less spiny-toothed. Spadix either simply or compoundly branched. Spathes coriaceous, widely tubular.

1. **Ch. Khasyana,** Griff.—An evergreen palm (12—25 + 9—20 + 1½—2½), the young leaves covered with fugaceous, tawny, paleaceous hairs, the trunk obscurely annular; leaves palmately flabellate, about 4-5 ft. across each way, the petiole 1½-2½ ft. long, cartilaginously and irregularly denticulate along the whole length of its margins, the sheaths dissolving into erect stiff fibres, pinnæ all united up to ⅔-½ of their length into a reniform blade, rigidly coriaceous, somewhat glaucescent beneath, the segments linear, bluntish 2-lobed at the apex; fruit-bearing spadix decompoundly branched, panicle-like, nodding, glabrous, the basal spathes up to a foot long, fuscous, smooth, coriaceous, gaping; calyx in fruit on a stout cylindrical base, the 3 sepals broadly oblong; petals cordate-ovate, as long as the sepals; ovaries villous; drupes about ½ in. long, solitary or by 2 or 3, unequally oblong, smooth (?), dirty blue; albumen homogeneous, horny.

HAB.—Not unfrequent in the drier hill and pine forests of the Martaban hills, at 4,000 to 6,500 ft. elevation; also Ava, Kakhyen hills.—I.—SS. = Metam.

LICUALA, Rumph.

Flowers hermaphrodite, bracteoled, spiked or racemose, in an erect or nodding branched spadix, the tubular spathes covering the peduncle. Calyx almost cup-shaped, 3-cleft; corolla 3-parted, valvate in the bud. Stamens 6, equal, the filaments at the base united in a cup; anthers ovate-oblong, erect, dorsifix. Ovaries 3, cohering with the style-column on the inner edge, especially upwards, 2 of them usually abortive and scale-like; ovules solitary in each cell, ascending from the inner basal angle. Drupe fleshy or dryish, globular to ellipsoid, 1-seeded, the putamen thin-crustaceous. Albumen bony, homogeneous. Embryo dorsal, oblique.—Elegant, usually small palms, often gregarious, with a simple stem or stemless. Leaves palmately or peltately fan-shaped, plaited, the pinnæ free to the base or variously united, the petioles aculeate-bordered.

× Flowers large; leaves peltately flabellate.
Calyx about ¼-⅓ in. long . . . . . *L. peltata.*
× × Flowers small; calyx not above 2 lin. long; leaves palmately flabellate.
Trunk 4-8 ft. long; petioles aculeate, bordered along their whole length; calyx about a line long . . . . *L. paludosa.*
Almost stemless; petioles unarmed at the upper third part of their length; calyx 1½ lin. long . . . . . *L. longipes.*

1. **L. peltata,** Roxb.—*Sa-lu.*—An evergreen usually gregarious palm (8—15 + 5—7 + ½—⅔), the stems annular; leaves peltately-fan-shaped, plaited, 3-5 ft. across, the petiole 3-4 ft. long, strong but slender, the margins armed with variously curved or straight longer or shorter sharp brown spines, the brown or blackish sheaths

netted-fibrous; pinnæ variously connate, the upper ones usually by 10-15, the lower ones by 3-5 only, the apices almost truncate and broadly and shortly 2-toothed, those of the lower pinnæ falcately produced and bluntish 2-lobed; flowers yellowish, rather large, sessile, in yellowish tomentose naked spikes arising distantly from the axillary, erect-nodding, slender peduncle, the latter covered with tubular spathes fugaceously downy while young; calyx almost bell-shaped, about $\frac{1}{4}$-$\frac{1}{3}$ in. long, shortly and broadly 3-toothed, silky pubescent outside, twice as long as the calyx, the lobes lanceolate, acute, nearly as long as the calyx; ovaries truncate-turbinate; drupes ovoid, the size of an olive, supported by the persistent leathery corolla and calyx, orange-coloured, smooth, 1-seeded, the pericarp fleshy.

Hab.—Frequent in the tropical forests all over Burma from Chittagong, Pegu, and Martaban down to Tenasserim and the Andamans.—Fl. begin. of C.S.; Fr. H.S.—s.—SS. = *SiS.* Metam.

2. **L. paludosa,** Griff.—An evergreen gregarious palm, (12—15+4—8+$\frac{1}{2}$-1), all parts glabrous, the trunk annular; leaves palmately fan-shaped, plaited, 2-3 ft. in diameter, the petiole 1-2 ft. long, slender, on the margins sparingly armed with short recurved spines, the sheaths splitting into strong, brown, netted fibres; pinnæ linear-cuneate, united by 3-8, each terminating in 2 converging, blunt, short lobes; flowers small, sessile, in naked spikes arranged in simply branched, shortly tomentose, partial spadices, which arise from the rather slender, long, erect-nodding spadix, the peduncle covered with tubular slightly scurfy spathes; calyx cup-shaped, shortly 3-lobed, about a line long, shortly tomentose; corolla hardly longer than the calyx, shortly and densely tomentose outside, the lobes short and triangular; berries obversely ovoid, the size of a pea, supported by the small tomentose perianth, smooth, 1-seeded, orange-coloured.

Hab.—Frequent in the tidal forests and in inundated marine swamps along the coast of the Andaman Islands.—Fr. Apr.-May.—l.—SS. = Sal.

3. **L. longipes,** Griff.—An evergreen almost stemless palm, otherwise of considerable size, all parts glabrous; leaves 3-4 ft. across, palmately fan-shaped, plaited, the petioles stout, 4-5 ft. long, on the borders from $\frac{1}{3}$ their length downwards armed with stout, horny, conical prickles, the sheaths dividing into leathery netted fibres; pinnæ 20-22, united by 2-3, otherwise free to the base, obliquely cut at the apex, and here unequally 2-4-lobed, the lobes irregularly toothed, the terminal pinnæ connate by 4-5, cuneate, truncate with 8-11 short, broad, 3-cleft lobes; flowers small, green, sessile, in rather stout spikes, forming a robust, much branched, scurfy, pubescent panicle-like spadix, the peduncle embraced by short tubular spathes which are greyish chaffy while

young; calyx cup-shaped, cylindrical, greyish-tomentose, 3-toothed, with the teeth occasionally 2-cleft, about 1½ lin. long; corolla nearly twice as long, densely tawny-tomentose outside, the lobes broadly cordate-lanceolate; ovary turbinate, fuscus-villous at the apex; stigmas 3; drupe seated on the stout pedicel-like perianth, sappy, 1-seeded.

Hab.—Forests south of Mergui, Tenasserim.—Fl. ∞.

BORASSUS, L.

Flowers dioecious. Spathes several, incomplete. Male flowers bracted, arranged in two rows in the cavities, forming (by coalition of the densely crowded scales) cylindrical catkins. Calyx 3-cleft. Corolla 3-parted. Stamens 6; filaments connate at the very base; anthers sagittate. Female flowers solitary within the scales of the catkin, 2- or more-bracted. Calyx 3-sepalous. Corolla 6-petalous, the petals imbricate-convolute. Sterile stamens 6, connate in a ring round the ovary. Ovary 3- (rarely 2- or 4-) celled; stigmas as many, sessile. Drupe large, containing 3 rarely 2 or 4 obcordate, compressed, fibrous-woody pyrenes, the mesocarp fibrous-fleshy. Albumen homogeneous, horny, turning hollow. Embryo apical, immersed.—Lofty simple-stemmed palms, with palmately fan-shaped leaves, the petiole spiny. Catkins robust, the male ones by 2 or 3, terminating the simple branchings of the spadix, the female ones simple and few.

1. **B. flabelliformis,** L.; Brand. For. Fl., 544.—*Htan.*—An evergreen lofty palm (60—70+50—60+5—6), all parts glabrous; leaves 6-10 ft. across, of a rigid texture, on a strong spiny-bordered petiole, palmately fan-shaped, many-cleft, the pinnæ 2-4 ft. long, horny-spiny on the margins, especially towards the base linear, 2-cleft at the apex; flowers in cylindrical, robust, dense catkins, arising by 2 or 3 from several branchings of the spadix, covered at the base by large spathes; peduncle, etc., all glabrous, the females in solitary or paired catkins; male flowers small, greenish white, sessile, the 3 petals tubular-connate at the base; female flowers large, nearly an inch in diameter, globular and partially protruding from the scales, green, the petals all broadly concave-ovate, closely and firmly embracing the globular large ovary; drupes obovoid-globular, brown, glossy, the size of a child's head, containing usually 3-4, large, woody, fibrous seeds, the mesocarp yellowish-fleshy-fibrous.

Hab.—Frequently cultivated all over Burma, especially in Ava and Prome districts.—Fl. March-Apr.; Fr. close of the rains.—l.—SS.=*All.* Ca (?).

Remarks.—Wood black, very hard and heavy, durable, very fibrous; □′.= 65 pd. Used chiefly for rafters, reapers, etc. Leaves yield a coarse fibre. Jaggry and toddy are extensively extracted from its spadices.

CARYOTA, L.

Flowers in the same spadix, monoecious, a female between 2 males. Spathes several, the basilar ones complete. Males: calyx 3-sepalous, imbricate in the bud. Corolla deeply 3-parted, valvate, coloured. Stamens numerous, the filaments very short, at the base united in a cup; anthers linear, basifix. Ovary-rudiment none. Females: calyx as in males; corolla imbricate in the bud; staminodes 3, club-shaped, or none. Ovary syncarpous, 1-3-celled, with a solitary ovule in each cell; stigmas as many as ovary-cells. Drupes usually 1- rarely 2- or 3-seeded, somewhat dry-fleshy. Seeds globular. Albumen horny, ruminate. Embryo dorsal.—Elegant, simple-stemmed or soboliferous palms often flowering only once in their life. Leaves bipinnate, with wedge-shaped erose-toothed pinnules. Flowers in spikes, forming nodding, large, simply-branched spadices. Berries globular or nearly so.

Simple-stemmed; male petals about ½ in. long by 3-4 lin. broad; anthers acuminate . . . . . *C. urens.*
Soboliferous; male petals about 4 lin. long by only 1½ lin. broad; anthers mucronulate to emarginate . . . . . *C. sobolifera.*

1. **C. urens,** L.; Brand. For. Fl., 550.—*Minbo.*—An evergreen palm (30—40 + 20—30 + 2—3), all parts glabrous; leaves ample, 10-15 ft. long, unpaired-bipinnate, on a very stout petiole, the sheaths coarsely fibrous-netted; pinnæ fascicled or generally alternate, 4-5 ft. long, the lowest pinnules attached to the petiole itself, the upper pinnules narrow- to broad-cuneate with the outer edge caudate-acuminate, obliquely truncate and lobed at the erose-toothed ends, 4-8 in. long, the terminal pinnules broadly cuneate, 2-3-lobed; flowers sessile, in monoecious, nodding, glabrous, large and robust panicle-like spadices, the peduncle covered with large spathes; male flowers rather large, yellow, the petals elliptically oblong, about ½ in. long by 3-4 lin. broad; anthers numerous, acuminate; female flowers greenish, often purplish outside, much smaller; petals only about 2 lin. long or somewhat longer, triangular-ovate; ovary usually 2-celled; drupes globular or nearly so, the size of a cherry, brownish, smooth, 1-2-seeded.

Hab.—Frequent in the upper mixed forests of the Pegu Yomah and Ava.—Fl. Sept.—l.—SS.=SiS. CaS.

Remarks.—Wood very fibrous and hard, siliceous. Trunks well adapted for water-buckets and water-trains. The pith yields sago. Yields also toddy. The leaves yield the kittul fibre of commerce.

2. **C. sobolifera,** Wall.—An evergreen soboliferous or rarely simple-stemmed palm (15—25 + 12—15 + 1—1½), the sheaths, etc., scurfy-downy; leaves 4-8 ft. long, unpaired-bipinnate, the

petiole and sheaths scurfy downy (?); pinnæ alternate; pinnules obversely cuneate-deltoid, obliquely cut and lobed, the outer margin acuminate, regularly or irregularly and rather bluntish (often deeply) toothed, 4-7 in. long; flowers sessile, spiked, forming a nodding rather large panicle-like spadix, the peduncle surrounded by large somewhat villous-scurfy glabrescent spathes; male flowers much smaller than in *C. urens*; petals only 4 lin. long or somewhat longer by 2 lin. broad; stamens less numerous (about 15-25); anthers mucronulate, occasionally blunt or almost notched; female petals only 1½ lin. long, triangular-oblong, only shortly exserted from the calyx; ovary 1- or 2-celled with as many stigmas; drupes globular or nearly so, the size of a cherry, smooth, bluish black, 1- or rarely 2-seeded.

Hab.—Frequent in the tropical forests from Arracan and Martaban down to Tenasserim and the Andamans, but apparently not in the Pegu Yomah.—Fl. Fr. C.S. and H.S.—s.—SS.=SiS. Metam.

Remarks.—Yields fibre similar to that of *C. urens*.

WALLICHIA, Roxb.

Spathes several, persistent. Flowers monoecious, the males and females in separate spadices, or the latter accompanied by males, rarely dioecious. Perianth 6-phyllous, the calyx in both sexes shortly 3-phyllous, the lobes almost orbicular, imbricate, or tubular or cup-shaped. Male flowers: corolla 3-petalous, valvate in bud, rigid. Stamens 6 or indefinite; filaments very short; anthers linear; ovary-rudiment none. Females: corolla urceolate, 3-cleft, valvate. Staminodes 3. Ovary 2- rarely 3-celled, with the ovules ascending from the base; stigmas as many as ovary-cells, acute, sessile. Drupe fibrous-fleshy, 2- or rarely 3-, or by abortion 1-seeded. Albumen horny, homogeneous. Embryo dorsal, conical.—Stemless or caulescent, rarely simple-stemmed, often soboliferous palms, with pinnate leaves, the pinnæ cuneate, erose-toothed, often lobed. Spadices nodding, the female one usually terminal, the males below, simply branched or rarely simple.

× Male spikes almost filiform.
Stemless, tufted; male flowers yellowish, the calyx tubular, about a line long . . . . . *W. caryotoides.*
×× Male spikes thick and rigid; spadix of both sexes very ample; male flowers purplish or green.
† Leaves placed in a ⅓ spiral.
Calyx tubular, nearly a line long; tufted stemless palm . . *W. densiflora.*
Calyx minute, cup-shaped, only about ⅓ lin. deep; trunk 3-4 ft. high, robust . . . . . *W. Yomæ.*
†† Leaves strictly distichous, like in *Ravenala*.
Calyx minute, cup-shaped, about ½ lin. deep; trunk slender, 8-15 ft. high . . . . . *W. disticha.*

1. **W. caryotoides,** Roxb. (*W. densiflora,* Brandis; For. Fl., 549, not Mart.).—*Zanoung.*—An evergreen, soboliferous, stemless or almost stemless tufted palm, the sheaths, etc., scaly and scurfy; leaves pinnate, 4-8 ft. long and longer, the petiole and rachis greyish scurfy; pinnæ cuneate-oblong, 1-1½ ft. long, strongly 1-ribbed, with numerous parallel veins, whitish beneath, sinuately lobed, the lobes sharply acute to truncate, sharply erose-toothed, the lowermost pinnæ often by 2-3, rarely 4, the terminal ones broader, more truncate-lobed; flowers small, in large panicle-like glabrous spadices, at the base surrounded by several large brown-scurfy spathes, the male ones nodding, the female ones almost erect; ramifications of the female spadix strong and thick, of the males very slender and thin; male flowers small, yellowish; calyx tubular-cup-shaped, about 1-1½ lin. long, 3-lobed, the lobes so short and broad as to give the calyx the appearance of being truncate; petals twice as long as the calyx, obovate-linear; stamens 6; female flowers larger and stout, roundish conical, the sepals about ½ lin. long, but very broad, confluent; petals ovate, acute, more than a line long; ovary about 2½ lin. high, 2-3-celled; hermaphrodite flowers, if present, few, with only 3 perfect stamens; drupes ovate-oblong, the size of a nutmeg, rather dry, smooth, 1- rarely 2-seeded.

Hab.—In the tropical and damp hill forests of Martaban and Tenasserim; also in the eastern Ava hills and Chittagong, up to 4,000 ft. elevation.—Fl. R.S.; Fr. the following year (?)—s.—SS.=Metam.

2. **W. densiflora,** Mart. (*W. oblongifolia,* Griff.).—An evergreen soboliferous often caulescent palm 8-15 ft. high, the trunk covered with villous-tomentose sheaths, the young parts scurfy-villous; leaves up to 10 ft. long, irregularly pinnate, the long petiole, rachis, and sheaths scurfy, the latter dissolving along the borders into strong fibres; pinnæ 1-2 ft. long, linear to oblong, cuneate, whitish beneath, irregularly lobed, often sinuately so, strongly 1-ribbed with many parallel nerves, the lobes irregular, rounded to acute, truncate and sometimes sinuate, sharply erose-toothed, the lowermost and often the following ones by 2-4, or all solitary, the upper and uppermost ones broader; flowers sessile, small, in ample panicle-like glabrous spadices, the ramifications of the males as thick as a quill, stiff, those of the females thicker and stronger; male flowers small, yellowish, the lower ones in pairs, with a rudimentary female between, the upper ones solitary; calyx cylindrical, nearly entire; corolla as long as the calyx, 3-parted nearly to the base; stamens 6, the filaments cohering rather high up to the petals; female flowers purplish, sometimes quite crowded, occupying the lower part of a flattish areole; calyx very short, divided to the middle into 3 broad rounded teeth; corolla shorter than the ovary, 3-cleft, the segments broadly half-ovate, blunt; ovary

2-celled; drupes oblong, surrounded at the base by the perianth, scanty fleshy, 2-seeded, about ½ in. long.

HAB.—Chittagong.

3. **W. Yomæ**, Kz. (*W. disticha*, Kz., not *T.* And.).—*Zanoung.*—An evergreen simple-stemmed palm (8—15+3—4+2—3), the young parts, sheaths, etc., greyish scurfy-tomentose, the leaves placed in a ⅓ spiral, the trunk brown, scared; leaves 6-10 ft. long, pinnate, the long petiole, rachis, and sheaths greyish tomentose and brown-scurfy; pinnæ 2-3 ft. long, linear to elongate linear-oblong, cuneately narrowed at the base, beneath indistinctly white-tomentose, irregularly lobed, strongly 1-ribbed with many parallel nerves, the lobes rounded to acute, sharply erose-toothed; flowers sessile, small, in ample panicle-like nodding spadices, the ramifications of the males strong, about 1½ lin. thick, rather stiff, those of the females about ⅓ in. thick or thicker; male flowers small, green or greenish purple; calyx minute, cup-shaped, only ⅓ lin. deep, broadly and truncately 3-toothed; petals linear-lanceolate, about 1½ lin. long; stamens 6; female flowers depressed-globular; calyx minute, 3-lobed; petals ovate, acute, about a line long; ovary depressed-globular, 2-3-celled.

HAB.—Not unfrequent in the upper mixed forests of the eastern slopes of the Pegu Yomah and on the spurs of the Kambala toung.—Fl. Apr.—s—l.—SS.= SiS.

ARENGA, Lab.

Flowers monoecious, generally but not always in separate inflorescences, sessile, supported by bracts or bractlets. Female flowers in the male spadices rudimentary, 2-bracteoled, each between 2 males. Spathes several, basilar. Males: calyx 3-sepalous, the sepals imbricate in the bud; petals 3, oblong, valvate; stamens indefinite, the filaments free and filiform; anthers linear, cuspidate. Female perianth nearly that of the males; staminodes none; ovary 3-celled, with a solitary ascending ovule in each cell. Drupes 2- or 3-pyrenous, the pyrenes 3-gonous. Albumen homogeneous. Embryo dorsal.—Erect palms, with simple stems often covered with the black fibrous remains of the leaf-sheaths. Leaves pinnate, more or less whitish beneath, the pinnae produced at the base into 1 or 2 auricles. Spadix panicle-shaped, simply branched, large, nodding.

1. **A. saccharifera**, Lab.—*Toung-ong.*—An evergreen palm (20—40+5—10+3—5), the trunk, especially upwards, covered with the petioles and netted, strong, black, fibrous remnants of the sheaths, the sheaths, etc., blackish scurfy; leaves 20-25 ft. long, pinnate, on

a strong scurfy petiole, the sheaths dissolving into black strong fibres; pinnæ 3-5 ft. long, almost sessile, with the base produced into 2 unequal (or the alternate pinnæ in a solitary) blunt auricles, alternate, solitary or (especially the lower ones) by 2 or 3, 4-5-farious, broadly linear (the lower ones narrow-linear), coriaceous, remotely toothed towards the 2-3-lobed or -cleft or simple apex, and here erose-toothed, glaucescent or white beneath, the midrib strong and 4-cornered, slightly scurfy; flowers sessile, in an ample panicle-like nodding, simply branched spadix, the peduncle covered with scurfy bracts; male flowers rather large, the sepals very short, rotundate and blunt; petals concave-oblong, blackish, purple outside, about $\frac{2}{3}$ in. long or somewhat longer; female flowers about $\frac{1}{2}$-$\frac{2}{3}$ in. across, almost half-globular, the calyx as in the males; petals triangular-ovate, acute, about $\frac{1}{2}$ in. long, purplish; drupes 3-gonously obovoid, with the apex depressed, $1\frac{1}{2}$-2 in. long, yellowish, smooth, the pericarp coriaceous, the mesocarp jelly-like and full of raphides, 3-pyrenous, the pyrenes dull black, convex on the outer, bifacial on the inner face.

Hab.—Frequent in the tropical forests of Martaban and Tenasserim, also occasionally in those of the eastern slopes of the Pegu Yomah.—Fl. ∞ ; Fr. the following year.—s.—SS.=*Metam.* SiS.

Remarks.—The trunk of the dead palm becomes soon hollow, and furnishes very durable under-ground water-pipes; also good for troughs or channels for water. The pith yields sago. The black fibre used for cordage renowned for its power of resisting wet. Each leaf yields from 8-16 ounces of clean fibre. The sap yields toddy and sugar.

PHŒNIX, L.

Flowers dioecious, sessile, usually bracted and bracteoled. Spadix branched, with a single complete spathe. Calyx in both sexes cup-shaped, 3-toothed. Corolla 3-petalous, in the males valvate, in the females imbricate in the bud. Stamens 6 or 3, very rarely 9; filaments short or almost wanting; anthers linear, erect. Ovaries 3, with a solitary erect ovule in each, globular-ovoid, free, with ripening uniting into a single ovary; stigmas sessile. Drupe 1-seeded, more or less oblong, the endocarp thin and membranous. Albumen with a longitudinal furrow, horny, homogeneous. Embryo dorsal or almost basal.—Erect, simple-stemmed or soboliferous or stemless palms, with pinnate leaves, the pinnæ rigid, linear. Spadices emerging from between the leaves, usually compressed.

* *Spathes glabrous; flowers supported by a small subulate bract.*

Stemless; petioles rather long and slender, spiny-armed . . *Ph. acaulis.*

* * *Spathes covered with a brown scurf; flowers without a bract.*

Simple-stemmed, robust ; petioles very short and dilated, spiny-armed ; drupes about an inch long . . . . . *Ph. sylvestris.*
Soboliferous, slender ; petioles long and slender, spiny-armed ; drupes about ½ an in. long . . . . . *Ph. paludosa.*

1. **Ph. acaulis,** Roxb. ; Brand. For. Fl., 555.—*Thin-boung.*—An evergreen low palm, with a thick, short, ovoid stem like a bulb, densely covered with the persistent and hardened bases of the petioles, all parts glabrous ; leaves pinnate, 2-6 ft. long, the petiole up to a foot long, or longer or shorter, armed with long sharp rather distant spines (reduced pinnæ), the sheaths brown, dissolving into netted fibres ; pinnæ usually by 2 or 3, approximate, complicate, rigidly coriaceous, linear, sharply pointed, ⅓-1½ ft. long ; flowers sessile, each supported by a subulate small bract, in flexuose (in the males almost filiform) spikes, forming a compressed longer or shorter-peduncled, at the apex almost flabellate and simply branched spadix of the length of, or somewhat longer than, the compressed linear-lanceolate, blunt, smooth spathe ; male flowers about 2 lin. long ; sepals ovate-lanceolate, nearly a line long ; female flowers thick and almost globular, about 1½ lin. high ; drupes elliptically oblong, mucronate, nearly ½ in. long, at the base supported by the cup-shaped perianth, smooth, bright red to bluish black, 1-seeded ; albumen white.

Hab.—Frequent in the Eng forests all over Pegu, Prome, and Martaban.—Fl. March-Apr. ; Fr. May-June.—l.—SS.= CaS. *Lat.*

2. **Ph. sylvestris,** Roxb. ; Brand. For. Fl., 554.—An evergreen simple-stemmed palm (25—40+15—30+3—5), all parts glabrous, the trunk covered with the persistent bases of the petioles ; leaves pinnate, 10-15 ft. long, the petioles short and dilated, bearing a few long sharp spines (reduced pinnæ) towards the apex, the sheaths hardly fibrous ; pinnæ by 2-4, twisted-fascicled, rigid, linear, subulate-acuminate, 1-2 ft. long, complicate, glaucous-green ; flowers small, sessile, bractless, in flexuose (the males in almost filiform) spikes, forming a compressed 2-3 ft. long smooth spadix of about the length of the spathe, the latter very coriaceous, brown-scurfy outside, separating into 2 boat-shaped valves ; peduncle compressed, about ½ ft. long, towards the apex almost flabellately-dividing into numerous half-whorled spikes ; flowers sessile, without a bract, the male ones about 3 lin. long, the calyx-lobes broadly triangular ; female flowers almost globular, about 2 lin. high ; drupes oblong, blunt, yellow, then orange-coloured, an inch long or longer, smooth, at the base supported by the perianth, 1-seeded, the mesocarp fleshy and yellow, edible ; albumen pale brown.

Hab.—Chittagong, cultivated ; said to be cultivated also in Ava.—Fl. begin. of H.S. ; Fr. C.S.—l.

Remarks.—Yields much palm-wine, which is converted into sugar.

3. **Ph. paludosa,** Roxb.—*Thin-boung.*—An evergreen soboliferous, often gregarious palm (8—25 + 3—15 + 1—1½), with slender annulate trunks, all parts glabrous; leaves pinnate, gracefully spreading, 8-10 ft. long, the petiole 3-5 ft. long, slender, fugaceously scurfy, armed with long, sharp, straight spines along the lower 3 ft. of length, the sheaths dividing into netted fibres; pinnæ solitary, usually approximate by 2, coriaceous and almost flaccid, subulate-acuminate, 1-2 ft. long, glaucescent beneath; flowers small, sessile, without a bract, in flexuose (in the males very slender) spikes, forming a compressed, smooth, simply and half-whorled-branched spadix on a much compressed peduncle ½ ft. long or longer; spathe solitary, 2-keeled, compressed, about 1-1½ ft. long (in the females only half as long), brown-scurfy outside; male flowers nearly 3 lin. long; calyx cup-shaped, the lobes very short and irregular; female flowers almost globular; staminodes 6; drupes elliptically oblong, about ½ in. long, mucronate, smooth, supported by the cup-shaped perianth, yellowish, then orange and black-purple, 1-seeded; albumen whitish.

Hab.—Common in the tidal forests all over Burma from Chittagong down to Upper Tenasserim and the Andamans.—Fl. March-Apr.; Fr. June-Dec.—l.—SS.=Sal.

ARECA, L.

Spathes solitary. Spikes usually twice, very rarely decompoundly, branched. Flowers monoecious on the same inflorescence, sessile, the females variously, one-sidedly or spirally arranged, occupying the lower or the upper part of the spike or the whole of it; male flowers solitary or by pairs supporting the female ones, or numerous. Males: calyx 3-toothed or 3-sepalous, not imbricate in the bud; petals 3, valvate; stamens 3 or 6; filaments short; anthers sagittate-linear. Ovary-rudiment present or not. Females: calyx 3-phyllous, and, like the petals, twisted-imbricate in the bud; staminodes present or not. Ovary 1-celled, with a solitary erect ovule; stigmas 3. Drupe 1-seeded, the mesocarp fibrous, the endocarp crustaceous, connate with the testa. Albumen horny, ruminate.—Simple-stemmed or soboliferous palms, not armed, with pinnate or rarely almost simple or incompletely pinnate leaves. Flowers in panicled or rarely simple spikes. Drupes more or less ovoid to oblong, usually scarlet, or orange-coloured.

× Stamens 6; female flowers without a bract.
Glabrous, simple-stemmed; drupes as large as a hen's egg . . . *A. catechu.*
× × Stamens 3; female flowers without a bract.
Glabrous, simple-stemmed or stoloniferous . . . . . *A. triandra.*

1. **A. catechu,** L.—*Kwam-thi-pen.*—An evergreen simple-stemmed palm (40—50 + 30—40 + 1½—3), all parts glabrous, the

trunk of the full-grown palm annulate, grey or almost white; leaves pinnate, with the end-pinnæ flabellately connate and 2-cleft, 4-5 ft. long or longer, on a short broadly sheathing petiole; pinnæ 1-1½ ft. long or longer, numerous and crowded, linear to linear-lanceolate, somewhat falcate, many-nerved, the lower ones finely acuminate, the upper confluent ones shortly and rather bluntish 2-lobed; spathe simple, glabrous, compressed, parallel-veined; spikes panicled, the rachis strong, smooth, compressed, the ramifications twice divided, terminating in slender long grooved male spikes, the female flowers solitary, rather large, sessile at the base of the branchings or in their axils, without bracts; sepals ovate, concave, bluntish, almost keeled on the back, about ⅓ in. long; petals conform, but not keeled and more acute; ovary surrounded by 6 connate staminodes; male flowers only a line long or somewhat longer, more or less distichous, with 6 stamens round an ovary-rudiment; drupes supported by the persistent perianth, ellipsoid, 1½-2 in. long, smooth, fleshy-fibrous, orange-coloured or scarlet, usually the size of a hen's egg.

Hab.—Frequently cultivated by Burmans and Karens, especially in Martaban and Tenasserim.—s.

Remarks.—Yields the well-known betel-nuts chewed by natives. The trunks are good for spear-handles and bows.

2. **A. triandra,** Roxb.—*Tau-kwam-thi.*—An evergreen stoloniferous or simple-stemmed palm (15—25 + 8—20 + 1—1½), all parts glabrous, the trunk annulate, glossy green; leaves 4 to 6 ft. long, pinnate with the end-pinnae flabellately confluent and 2-cleft, the rachis smooth, the petiole slender, up to a foot long, sheathing at the base; pinnae linear-lanceolate, somewhat falcate, irregularly approximate or connate by 3 or 2 or solitary, with a strong midrib and numerous parallel nerves, 1½-3 ft. long, the lower and median ones long-falcately-acuminate, the upper confluent ones shortly and rather bluntish 2-lobed; spathe simple, coriaceous, compressed, smooth, up to a foot long or longer; spikes panicled, thrice ramified, the rachis thick and compressed, smooth, the male end-spikes thin and almost filiform, the female flowers lateral and axillary, sessile, without bracts; sepals in females oval, blunt, nearly ⅓ in. long; petals almost conform, the ovary surrounded by 6 very small staminodes; male flowers minute, sessile, one on each side of a female flower and distichous and numerous along the end-spikes, with only 3 stamens round a rudimentary ovary; drupes oblong, the size of an olive, narrowed at the truncate apex, fleshy-fibrous, smooth, orange-coloured, turning scarlet.

Hab.—Not unfrequent in the tropical forests from Martaban down to Tenasserim and the Andamans; also Chittagong.—Fl. H.S. & R.S.; Fr. the following year.—s.—SS.=SiS. Metam.

PINANGA, Bl.

Spathes solitary or 2. Spikes usually simply branched or rarely unbranched. Flowers monoecious on the same inflorescence, the females spirally arranged in 2-6 rows, usually supported by 2 male flowers. Males: calyx 3-toothed. Petals 3, valvate. Stamens numerous; filaments short; anthers sagittate-linear. Ovary-rudiment none. Females: calyx 3-sepalous; corolla 3-petalous, twisted-imbricate. Rudiments of stamens none. Ovary 1-celled, with a solitary erect ovule; stigma 1. Berry 1-seeded, usually obovoid, the mesocarp fibrous, the endocarp thin. Albumen horny, ruminate. Embryo basilar, excentrical.—Usually slender, simple or soboliferous palms of the habit of *Areca*.

\+ Flowers distichous.
Tufted; spadix branched; sheaths, etc., slightly scurfy . . *P. costata.*
\+ + Flowers 3-stichous.
Simple-stemmed; spadix slender, ramified or simple; sheaths, etc., scurfy . . . . . *P. gracilis.*
\+ + + Flowers 5- or 6-stichous.
Simple-stemmed; sheaths, etc., scurfy; spadix simple, fleshy, as thick as the finger . . . . . *P. hexasticha.*

1. **P. costata**, Bl.—An evergreen soboliferous palm (20—30 + (?) + ½—½), the sheaths, etc., indistinctly scaly-rough; leaves 3 to 4 ft. long, on a shorter or longer indistinctly scaly petiole up to ⅔ ft. long, pinnate, with rather narrow confluent end-pinnae; pinnae 1-2 ft. long, linear to linear-lanceolate, somewhat falcate, prominently and strongly 2- to 3-ribbed above, the lower ones long-acuminate, the upper and terminal ones terminating in as many bluntish 2-lobed lobes; flowers sessile, distichous, either all females in the same spadix, or each female accompanied by 2 males, forming a more or less robust, simply branched, glabrous, panicled spadix up to a foot long; sepals and petals in the female flowers almost conform, nearly 1½ lin. long, broadly ovate or orbicular, blunt or obsoletely mucronulate; drupes seated on the cup-shaped perianth, obovoid to ellipsoid, smooth, thin fleshy-fibrous, nearly ½ in. long, smooth.

Hab.—In the tropical forests of South Andaman.—Fr. June.—s.—SS.= SiS.

2. **P. gracilis** (*Areca gracilis*, Roxb.).—*Tau-kwam-thi.*—An evergreen simple-stemmed palm (6—20 + 3—15 + ¼—⅓), often gregarious, the trunk slender, short-annulate, thicker upwards, the leaf-sheaths scurfy-roughish; leaves pinnate, 3 to 4 ft. long, on a rather slender petiole ½-¾ ft. long, the rachis, like the sheaths, scaly-scurfy; pinnae from a few to 12 or more, linear-lanceolate, almost falcate, about a foot long or longer, the lower ones strongly 3- to 2-ribbed and acuminate, the end-pinnae flabellately confluent, 2-cleft and

shortly 2-lobed; spathe solitary, 2-cleft at the apex; spadices reflexed, white or scarlet, usually simply branched, rarely simple, glabrous, either the female flowers for themselves on separate spadices, or each accompanied by 2 males; flowers in 3 series; sepals in females oval, bluntish, about a line long, the petals somewhat longer; staminodes none; calyx of male flowers minute, 3-cornered; petals 3, obliquely cordate, acute, many times longer than the calyx; stamens numerous; ovary-rudiment none; drupes ellipsoid-spindle-shaped, tapering at the apex, seated on the cup-shaped perianth, fleshy-fibrous, about ½ in. long or a little longer, smooth, scarlet or orange.

Hab.—Frequent in the tropical forests, especially in marshy localities, from Chittagong, Pegu and Martaban down to Tenasserim—Fl. H.S. & R.S.; Fr. the following year.—s.—SS.=SiS. Metam.

3. **P. hexasticha** (*Areca hexasticha*, Kz.).—An evergreen slender, simple-stemmed gregarious palm (25—30 + 15—25 + 1—1⅓), the sheaths, etc., thinly scaly-rough, soon turning glabrous; leaves 3 to 5 ft. long, pinnate, with the end-pinnæ confluent, on a short 3 to 4 in. long scaly-rough petiole broadly sheathing at the base; pinnæ linear, somewhat falcate, 1 to 1½ ft. long, alternate, 2- to 3-ribbed and many-nerved, the lower ones acuminate, the upper and terminal ones crenate-lobed and ending into as many bluntish and shortly 2-lobed lobes as there are ribs; flowers sessile, spirally arranged into 5, higher up into 6, grooved rows along the simple reflexed spike up to a foot long, the rachis as thick as the finger, fleshy; female perianth (in young fruit) very much like that of *A. gracilis*, the sepals and petals almost conform, broad-oval, blunt or bluntish, about a line long or a little longer; staminodes apparently none; unripe fruits fibrous-fleshy, smooth, spindle-shaped and narrowed at apex.

Hab.—In marshy places of the tropical forests of the southern parts of the Pegu Yomah, as, for example, between Kyauzoo and Kya Eng (Pazwoondoung valley).

COCOS, L.

Flowers monoecious in the same spadix, sessile, bracted, the males more on the upper branchings. Spathe simple, woody, spindle- or club-shaped. Males: calyx 3-sepalled, the sepals lanceolate, keeled, often connate at the base. Petals 3, membranous or almost fleshy. Stamens 6, inserted on the torus; filaments subulate; anthers linear, almost sagittate, erect. Ovary-rudiment minute or wanting. Females: sepals 3, almost orbicular, imbricate-convolute. Petals 3, usually included in the calyx, almost orbicular, imbricate-convolute. Ovary ovoid or depressed-globose,

3-celled (2 of the cells barren); style very short or none; stigmas 3. Drupe ovoid-3-gonous, woody, 1-seeded, the mesocarp woody-fibrous, the putamen horny and 3-porous at the base. Albumen homogeneous or asbesth-like radiate, amygdaline or horny.—Simple-stemmed often lofty palms with pinnate leaves, the petiole unarmed or rarely armed. Drupes usually very large.

1. **C. nucifera**, L.; Brand. For. Fl., 556.—*Ong.*—An evergreen simple-stemmed palm (40—80+30—60+3—6), all parts glabrous, the trunk annulate, thickened at the fibrous-rooted base; leaves pinnate, 12-18 ft. long, the petiole very strong, 3 to 5 ft. long; pinnae linear-lanceolate, acuminate, coriaceous, but rather flaccid, 2-3 ft. long; spadix 4 to 6 ft. long, simply panicled, the branchings strong but flexuose; spathe cylindrically oblong, tapering at both ends, bursting longitudinally, glabrous or sometimes covered with a fugaceous down, 2-3 ft. long; male flowers numerous, occupying the upper part of the spikes or sometimes by pairs flanking the female flowers, rather small, yellowish; sepals ovate, acute, hardly a line long; petals about 3 lin. long, oblong-lanceolate; stamens 6; ovary-rudiment a short 3-styled column; female flowers usually solitary, large, resting on 2 broad bractlets; sepals about an inch long, broadly concave-orbicular, rather blunt; petals conform, but somewhat smaller. Ovary somewhat conical, at the base surrounded by an annular orange-coloured disk; stigma sessile, slightly 3-lobed; drupes more or less globular to obovoid, often somewhat 3-cornered, woody, brown or green, or even orange-coloured to yellow, the size of a child's or man's head, smooth, one-seeded.

Hab.—Generally cultivated all over Burma and adjacent islands, but best thriving in the vicinity of the sea; really wild on the Cocos Islands and along the north-western coast of North Andaman.—Fl. C.S.; Fr. H.S.—l.—SS.= Aren.

Remarks.—Wood strong and durable, very fibrous, heavy, said to last for 20 to 50 years. □′=70 pd.; good for small boats, ridge-poles, house-posts, and rafters, &c.; the pith furnishes a substitute for sago; each tree produces annually from 30 to 60 cocoa-nuts; the husk of the nuts yields fibre, while the shells are susceptible of a high polish and fit for fancy work, like cups, &c.; the hollow albumen yields the well-known cocoa-oil, while the oil-cakes furnish a valuable manure; palm-wine, too, is obtained from the spadices; the uses of the cocoa palm are too various to be all enumerated here.

NIPA, Rumph.

Flowers monoecious, the males forming catkins on the branched lateral-sheathed spadices, the females in the centre and forming a spathed and dense head. Males: calyx 3-sepalled. Corolla 3-petalled, conform to the sepals and also valvate in the bud. Stamens 3, united into a single one; anthers longitudinally adnate,

extrorse. Females: perianth reduced to a few scales. Ovary of 3 distinct angular carpels obliquely truncate; stigmas sessile, solitary, excentrical. Drupes woody, angular-turbinate, 1-seeded, the mesocarp woody-fibrous; putamen woody, penetrating and lengthwise excavating the seed. Albumen homogeneous, horny, hollow in the centre. Embryo basal.—Almost stemless or short-stemmed soboliferous palms, with pinnate leaves, not armed. Drupes woody, in large globose terminal heads.

1. **N. fruticans,** Wurmb.—*Da-ne.*—An evergreen large soboliferous almost stemless or short-stemmed palm (the trunk very thick), all parts quite glabrous; leaves pinnate, 15 to 30 ft. long, the petiole 4 to 5 ft. long, very strong and thick; pinnae 4-5 ft. long, linear, subulate-acuminate, rigid, plaited, one-ribbed, with 3 lateral ribs along the plaits and one marginal one along the one margin; spadix erect, terminal, monoecious, covered with numerous smooth brown spathes, growing up to 4 to 7 ft. in height, the peduncle 3-5 ft. long, the lateral branchings bearing the males collected in dense short-peduncled thick catkins, the central erect one terminated by a head of naked large ovaries; drupes unequally angular-turbinate, 4 to 6 in. long, densely crowded in a large head, smooth, chestnut-brown, fibrous-woody, containing a large fibrous-woody ovoid-globose 1-seeded putamen; albumen horny and hard, snow-white.

Hab.—Common along the estuaries of the rivers, and in tidal forests all along the shores, from Chittagong down to Tenasserim and the Andamans.—s.—SS.=Sal.

Remarks.—The leaves used extensively for thatching; the seeds might be used for vegetable ivory.

LILIACEÆ.

Flowers usually regular, hermaphrodite or unisexual. Perianth inferior, petal-like, 6-parted or 6-toothed, very rarely 3-lobed. Stamens 6, very rarely 3, inserted at the base of the perianth-segments or in the tube. Ovary free, superior, 3-celled, very rarely incompletely so, with several or a single ovule in each cell; style simple, with an entire or 3-lobed stigma, or rarely wanting, and the 3 stigmas sessile. Fruit a berry or capsule. Embryo immersed in a fleshy albumen.—Undershrubs or bulb herbs, rarely shrubs or trees. Leaves simple, rarely digitate, sometimes radical.

A large order, including several tribes, which often are considered distinct orders, such as *Melanthaceæ* and *Smilaceæ*. The well-known onion, garlik, leek and asparagus belong to this family. The woody roots of *Cordyline Ti* are baked and afford an important part of the food of a Sandwich Islander. Aloes and squills are used medicinally,

the acrid matter which they contain renders them valuable as purgatives and emetics. Sarsaparilla is the produce of several American species of *Smilax* (*S. Purhampuy, S. medica, S. syphylitica,* and *S. officinalis*), and that yielded by some Indian species is considered not much inferior to the American. Dragon-blood, a tonic astringent resin, is yielded by *Dracaena Draco,* but it is usually substituted by the resin of padouk (*Pterocarpus*). Botany Bay gum, a fragrant brownish-yellow resin, comes from the Australian grass-tree (*Xanthorrhœa arborea*). It is, however, more for the valuable fibre-plants which this family contains that makes it also interesting to the forester. New Zealand flax (*Phormium tenax*) and African or Bowstring hemp (several species of *Sanseviera*) are well-known examples. *Yucca,* too, yields very tenacious fibre. The tribe *Melanthaceæ* is remarkable for its poisonous qualities, and the poung-yees often collect the poisonous roots of *Gloriosa* for medicinal purposes.

Fruit a succulent berry; ovary-cells with a solitary ovule . . . *Dracaena.*
As former, but the ovary-cells with several ovules . . . . . *Cordyline.*

DRACAENA, Vand.

Perianth corolla-like, tubular, deeply 6-cleft, caducous, the lobes valvate in the bud. Stamens 6, adnate to the perianth-tube and free from the throat; anthers 2-celled, versatile. Ovary free, 3-celled, with a solitary ovule in each cell; style 3-sulcate, filiform; stigma capitately 3-lobed. Berry 3- or by abortion 2- or 1-lobed, with as many globular seeds as lobes. Embryo lateral at the base of the horny albumen.—Trees or shrubs, usually more or less branched, the stems marked with the half-circular scars of the fallen leaves. Leaves from linear to elliptical, petioled or sessile and half-stem-clasping. Flowers usually fascicled and irregularly bracted, forming a simple raceme or a more or less branched terminal panicle.

* *Flowers in panicles.*

× Leaves sessile with a narrowed stem-clasping base; perianth-lobes more or less recurved from the middle.

Tree; panicle erect, shorter than the leaves, stiff; outer bractlets 1-2 lin. long, with scarious border; filaments white; berry-lobes the size of a small pea . . . . . *D. angustifolia.*

Tree of the habit of preceding, but leaves narrower and the berry-lobes as large as a cherry or small plum . . . . . *D. linearifolia.*

Treelet; panicle nodding, longer than the leaves, flexuose; bracts acute, almost wholly scarious; filaments orange; pedicels ½ in. long . . . . . *D. ensifolia.*

Small shrub; panicle much shorter than the ¼-½ in. long leaves, erect, stiff; bracts linear, acuminate, herbaceous, with scarious margin; pedicels only 2-3 lin. long . . . . . *D. brachyphylla.*

× × Leaves narrowed in a complicate shorter or longer petiole.

○ Perianth-lobes erect-spreading, conniving in a tube.—Small shrubs.

Flowers sparse; bractlets 1 lin. long or longer . . . . *D. elliptica.*
Flowers 1-sided; bractlets minute, broad and scarious . . *D. Helferiana.*

○ ○ Perianth-lobes recurved from the middle.—Trees.

Panicle rather contracted; corolla twisted; bracts scarious . . *D. ternifolia.*

* * *Flowers in simple terminal racemes; leaves narrowed in a leafy petiole.*

Peduncle shorter than the leaves, bracted-scaly; pedicels short; corolla twisted, the tube long, the lobes short, spreading; tree . *D. spicata.*
Peduncle short or almost none, the raceme about as long as the petiole; pedicels very short; corolla not twisted, the lobes not recurved; small shrub . . . . . *D. pachyphylla.*

1. **D. angustifolia,** Roxb.—*Kwam-lin-nek.*—An evergreen tree (20—30 + 5—12 + 2—3), forkedly branched, all parts glabrous, flowering already while still shrubby; leaves crowded at the end of the branches, elongate-linear, 1-2 ft. long by 1-1½ in. broad, long-acuminate, thick-membranous, waved, gradually narrowed and half-stem-clasping with a broad base, the midrib blunt and prominent below, the lateral nerves faint, immersed; flowers middling-sized, white, or with purplish tips, nearly an inch long, on longer or shorter (1-4 lin. long) pedicels jointed at the middle, by 5-3 or fewer in bracteoled clusters, remotely racemose and forming a lax but stiff, erect, or ascending, glabrous terminal panicle; bracts of the branchings linear-lanceolate, rather small; bractlets ovate, acute, 1-2 lin. long; perianth 6-lobed down to its middle, with the linear lobes reflexed; filaments white; berries 1-3-lobed, the lobes globular, the size of a pea, orange-coloured, glossy, 1-seeded.

Hab.—Not unfrequent in the tropical coast forests of South Andaman.—Fl. Apr.-May; Fr. Sept.-Oct.—s.

2. **D. ensifolia,** Wall.—An evergreen simple or slightly branched shrub up to 8-10 ft. high, the stems as thick as the finger, all parts glabrous; leaves crowded at the apex of the branches, elongate-linear, long-acuminate, slightly tapering at the base and broadly stem-clasping, 1-2 ft. long by about an inch broad, thick-membranous, the midrib strong and blunt, the nerves faint and immersed; flowers middle-sized, greenish white, on slender 3-4 lin. long pedicels jointed above the middle, usually by 3 or 4 or fewer, clustered with as many membranous, ovate, acute bractlets at the base, remote-racemose, forming a reflexed, almost pendulous, flexuose, lax, glabrous terminal panicle, the branches of which are all more or less curved; bracts conspicuous, those of the lower branchings up to an inch long, cymbiform-lanceolate, long-acuminate; perianth about ⅔ in. long, divided to ½ into 6 linear-oblong reflexed lobes; filaments orange-

coloured; berries 3-1-lobed, the lobes as large as a pea, globular, orange-yellow, glossy, 1-seeded.

HAB.—Upper Tenasserim.

3. **D. brachyphylla,** Kz.—An evergreen, low, thinly branched glabrous shrub, the stems as thick as a goose-quill to twice this thickness; leaves linear, and sessile with a shortly tapering, broad, stem-clasping, leafy petiole-like base, ½-1 ft. long, acuminate, thin-chartaceous, the midrib evanescent towards the apex, the nerves faint but prominent; flowers white, ⅔ in. long, on 2-3 lin. long pedicels jointed above the middle, by 2 or solitary, forming short and rather stiff racemes collected in a sessile, short, erect, glabrous panicle at the end of the branchlets; bracts linear-lanceolate, subulate-acuminate, the lower ones up to ½ in. long; bractlets ovate, acute, membranous, with scarious margins, about a line long; perianth 6-cleft to near the base, the lobes conniving in a tube and erect-spreading at the apex; filaments white.

HAB.—Frequent in the tropical forests of the Andamans.—Fl. Apr.-May.—s.—SS.=Metam. SiS.

4. **D. elliptica,** Thbg.—An evergreen, low, simple or sparingly branched decumbent or ascending shrub 1-2 ft. high, the stems short, rooting, about the thickness of a goose-quill; leaves rather remote, those at the apex often crowded or whorled by 3-4, elliptical to oblong and linear-lanceolate, 4-6 in. long by 1-2½ in. broad, acuminate or almost cuspidate, more or less suddenly narrowed in a short distinct petiole half-stem-clasping with a broad base, uniformly green or often whitish or blackish blotched, thin-coriaceous, the midrib distinct only at the base, the faint lateral veins slightly curved; flowers rather small, white, on slender 3-4 lin. long pedicels jointed near the base, by 3 or fewer together, remotely racemose and forming a divaricately bracted, glabrous, loose, usually curved panicle at the end of the branches; bracts small, scarious, broadly oval; bractlets ovate, acute, about a line long, scarious; perianth about ¾ in. long, slender, divided to near the middle into 6 linear, erect and hardly spreading lobes; filaments white; berries 3-1-lobed, the lobes almost globular, the size of a small pea, 1-seeded, orange-red, glossy.

Var. 1, **elliptica proper:** flowers by 2 or 3, white; leaves elliptical to broadly oblong-lanceolate, the upper ones usually ternary or 4-nary.

Var. 2, **atropurpurea,** Bak.: flowers usually solitary, purplish outside; leaves more or less purplish green, longer petioled.

HAB.—Var. 1: frequent in the tropical forests all over Burma from Chittagong, Pegu, and Martaban down to Tenasserim and the Andamans; var. 2: in Tenasserim.—Fl. C.S.—SS.=Metam. SiS.

5. **D. Helferiana,** Kz.—An evergreen, small, decumbent, simple or slightly branched glabrous shrub 1-2 ft. high, the stems as thick as a goose-quill or thicker, rooting towards the base; leaves approximate, obversely lanceolate-oblong, sessile with a dilated base or tapering in a longer or shorter, broad, leafy, sheathing petiole, acute or shortly acuminate, 1-1½ ft. long by 1½-2 in. broad, slightly waved, thin-coriaceous, the midrib almost evanescent towards the apex, the lateral nerves thin but prominent; flowers white, with a greenish tube an inch long, on slender pedicels jointed towards the base, by twos or threes, all secund and forming a divaricate ample glabrous panicle at the end of the stems; bracts linear-lanceolate, those of the lower branchings up to an inch long, deciduous; bractlets ovate-lanceolate, minute; perianth inflated at the base and 6-cleft to near the base, but the linear blunt lobes erect and spreading only at their tips; filaments white; berries 1-3-lobed, the lobes almost globular, the size of a pea, orange-red and glossy, 1-seeded.

HAB.—Frequent in the tropical forests from Pegu and Martaban down to Tenasserim.—Fl. Feb.-Apr.; Fr. the next year.—s.—SS.=Metam. SiS.

6. **D. ternifolia,** Roxb.—An evergreen, low, decumbent, simple or slightly branched shrub 1-3 ft. high, all parts glabrous, the stems as thick as a goose-quill or thicker, rooting at the base; leaves rather crowded, lanceolate to obversely lanceolate, narrowed in a shorter or longer (1-3 in. long) petiole with a widened half-stem-clasping base, ½-1 ft. long by 1-2 in. broad, acute or shortly acuminate, thin-coriaceous, the midrib evanescent towards the apex, the lateral nerves thin but prominent; flowers white, about an inch long, on very short jointed pedicels, usually by 3 or 2 together and arranged in an almost simple raceme with or without a few short additional racemes or collected in a contracted glabrous panicle at the end of the branches; bracts linear-lanceolate, persistent, those of the lower branchings about ½ in. long; bractlets conspicuous, ovate, acute, scarious, about 2 lin. long; perianth 6-lobed to the middle, twisted after flowering, the linear blunt lobes reflexed; filaments white; berries usually 1-lobed with the 2 other lobes rudimentary, globular, the size of a large pea, orange-red and glossy, 1-seeded.

HAB.—Ava, Kakhyen hills.—Fl. March-Apr.

7. **D. spicata,** Roxb.—An evergreen tree (10—15+5—10+½—1½), forkedly branched, all parts glabrous; leaves crowded at the end of the branches, lanceolate to obversely elongate-lanceolate, gradually tapering into a broad leafy half-stem-clasping petiole 1-1½ in. long, acuminate, 1-1½ ft. long by 1½-2 in. broad, thin-coriaceous, sometimes blotched, the midrib evanescent towards the apex, the lateral veins thin but prominent; flowers rather small, greenish yellow, slender, up to an inch long, on very short (1-2 lin.

long) pedicels jointed at the apex, usually by 3 or 2, forming a long and strong-peduncled terminal simple raceme; bracts at the base and on the peduncle lanceolate, subulate-acuminate; bractlets ovate, acute, about a line long; perianth 6-lobed to about $\frac{1}{3}$ of its length, the tube strongly twisted, the lobes short, oblong, blunt, spreading; filaments white; berries 3-1-lobed, the lobes globular, the size of a pea, crimson, glossy, 1-seeded.

Hab.—Not unfrequent in the tropical forests of South Andaman; also in Chittagong.—Fl. Apr.-May.—s.—SS=SiS. Metam.

8. **D. pachyphylla,** Kz.—An evergreen, low, erect or ascending simple or slightly branched shrub 1-2 ft. high, all parts glabrous, the stems becoming as thick as the little finger; leaves elliptical to elliptically lanceolate, acute or subulate-acuminate, coriaceous, often blotched, 4-6 in. long by $1\frac{1}{2}$-$2\frac{1}{2}$ in. broad, the midrib evanescent towards the apex, the veins thin but prominent, the lower leaves gradually tapering in a complicate 1-2 in. long petiole half-stem-clasping at the dilated base, the upper ones more abruptly contracted in a leafy broad petiole up to an inch long; flowers white, on very short and rather robust jointed pedicels, forming a short (1-2 in.) -peduncled, glabrous, spike-like, terminal raceme of the length of the petiole or somewhat longer; perianth about $\frac{3}{4}$ in. long, slightly inflated at the base, 6-cleft almost to the base, the lobes erect and conniving into a tube, only at the apex somewhat erect-spreading; berries 3-1-lobed, the lobes globular, the size of a pea, red and glossy, 1-seeded.

Hab.—In the tropical forests of South Andaman.—Fr. May-June.—s.—SS. =Metam. SiS.

CORDYLINE, Commers.

Perianth corolla-like, bell-shaped, more or less deeply 6-cleft deciduous, the lobes recurved. Stamens 6, inserted at the throat of the corolla, exserted; anthers 2-celled, introrse. Ovary 3-celled, with several ovules in each cell placed in a double row; style simple, the stigma 3-cleft or -lobed or simply capitate. Berry 3-celled, with several or by abortion a solitary seed in each cell.—Erect arborescent shrubs, simple-stemmed or slightly branched, with simple petioled approximate leaves. Flowers usually rather small, solitary, each supported by 3 bractlets (the upper ones usually connate, spiked), and forming an ample terminal panicle.

1. **C. terminalis,** Kth.—An evergreen erect branched glabrous shrub, 8-10 ft. high, the stems as thick as the finger or somewhat thicker; leaves 1-3 ft. long by 2-5 in. broad, oblong-lanceolate, subulate-acuminate, on a 2-4 in. long complicate petiole

gradually widened towards the base and stem-clasping, acuminate at the base, chartaceous, glabrous, green or purplish ; flowers rather small, solitary, white or purplish, sessile or on very short pedicels, spiked or racemose, forming an ample, terminal, glabrous panicle ; bracts of the lower branchings linear-lanceolate, acuminate, up to 1½ in. long ; bractlets ternary, about 1-1½ lin. long ; perianth ⅓ in. long, 6-cleft almost down to the inflated base, the lobes recurved.

Var. 1, **terminalis proper :** flowers somewhat larger, sessile or nearly so.

Var. 2, **ferrea,** Baker : flowers slightly smaller, on distinct pedicels shorter or slightly longer than the bractlets.

Hab.—Var. 1 only : cultivated in Burmese villages, chiefly around khyoungs. —Fl. C.S.

GRAMINEÆ.

Flowers hermaphrodite or unisexual, in *spikelets,* without any perianth. Spikelets 1- or several-flowered, with 1 or 2 bracts (*glumes*) at their base, rarely the glumes wanting. Genitals naked or surrounded by 2 or 3 minute scales called *lodicules,* enclosed in 2 oppositely alternating, chaff-like, concave scales, called *upper* and *lower valves* or *paleas,* those of the lower or the uppermost ones often barren or suppressed altogether. Stamens usually 3, rarely reduced to 1 or 2, or (in bamboos chiefly) increased to 6 and more ; anthers versatile, 2-celled. Ovary 1-celled, with 1 ovule ; style 2- or 3-lobed, or more frequently divided to the base into 2 or 3 more or less feathery styles. Fruit 1-seeded and seed-like, called usually a *caryopsis,* free or adhering to the persistent upper valve, or enclosed in both hardened valves. Pericarp very thin, adhering to the seed, or rarely loose, coriaceous or crustaceous or fleshy, or very rarely opening in 2 valves. Embryo small, at the base of a mealy albumen.—Herbs, or rarely shrubs or trees, with hollow stems interrupted by solid nodes. Leaves alternate, distichous, parallel-veined, sheathing the branches with their bases or rarely (chiefly in bamboos) on longer or shorter petioles jointed with the sheath, the latter split open to the very base and often terminating in a scarious fringed or naked small appendage called a *ligule.* Spikelets variously arranged in terminal spikes, racemes or panicles.

A most important order of about 4,500 species, of which rather more than 170 species are found in Burma and the adjacent islands, but of these only the bamboos are woody and can come here into special consideration. Amongst the cereal-grasses, wheat, barley, rye, oats, maize, rice and guinea-corn require only to be named, for they form the great bulk of food for the sustenance of man. Other food-grains are yielded by *Eleusine coracana,* millet (*Setaria italica,*

and other species), *Panicum miliaceum*, *P. frumentaceum*, and *P. pilosum*, *Penicillaria spicata*, the different kinds of *Sorghum*, more especially *S. saccharatum*. Cattle depend not less upon the grass-family than man, and these fodder grasses are too numerous to be summed up here. Sugar is a general produce of grasses, and exists in such great quantities in the sugarcane (*Saccharum officinarum*) that by far the largest proportion of sugar in the trade is the product of this grass. Several of the grasses are fragrant, and others contain an essential oil.

In tropical countries bamboo is one of the most important productions. Bamboo is the material most used in house-building, and different species are adapted differently for the several parts of which a native house consists,—strong and thick-wooded bamboo-stems being used for house-posts, cross-bars, etc., while thin-wooded kinds are split and serve for floors, mats, walls, etc. The younger stems slit into thin strips are used instead of ropes and strings. Immerging in water for several days is a requisite for making these stems more proof against the various destructive xylophages. For hedges and fences are chiefly thorny and shrubby bamboo in use, and the thorny ones are also generally used as defence in time of war. For scaffolding, bridges, rafts, floating timber, etc., bamboo is invaluable; for the latter purpose Burmese use chiefly Waya, Kyattounwa, and Wabo. The native furniture as well as other utensils, such as serve for drinking, eating or storing small goods, as also the water-tubes in which water is fetched from the river or stored in the house, are usually made of bamboo. In many countries they serve also for axles, poles, and other parts of a native cart. For basket and fancy-work bamboo is admirably fitted, and the most exquisite triumphal arches, with flowers, bands, etc. (all of bamboo), are erected at festivals by the natives. The young stems, as also a few of the softer wooded kinds of bamboo, yield ample material for paper-making and even for coarse clothing and gunny-sacks. Musical instruments, too, from the harp and flute to the drum, are made of the same useful grass. The young shoots of many species are eaten cooked in curries, etc., or pickled, and form the well-known Malay bamboo-atchar. Silica is contained in the wood in great quantity, and in one species so much that the wood gives off sparks when cut or stroke with iron dahs.

(*Bamboos with usually petioled leaves, the petiole articulate-inserted; stems in all species woody.*)

* Stamens 3.—More or less shrubby bamboos.

Inner palea bicarinate; caryopsis with a membranous closely adnate pericarp; style caducous . . . . . *Arundinaria.*

* * Stamens 6 or more, free or connate.

× Caryopsis small, wheat-like, with a membranous pericarp closely adnate to the seed, the style caducous.

○ Filaments free.

Inner palea boat-shaped and 2-carinate; arboreous bamboos, rarely shrubby . . . . . *Bambusa.*

○ ○ Filaments connate in a tube.

Inner palea boat-shaped and 2-carinate; arboreous bamboos . . *Gigantochloa.*

× × Caryopsis often rather large; the pericarp separating already before full ripeness into an outer firmly coriaceous or thick fleshy wall (epicarp), the inner cellular tissue in a dried state more or less closely embracing the seed, the style persistent or rarely caducous.

○ Inner palea boat-shaped and 2-carinate, or more or less deplanate with a 2-keeled apex.

† Caryopsis rather small.

Style collapsing in fruit; caryopsis more or less terete; inner palea boat-shaped, 2-carinate. . . . . *Dendrocalamus.*

Style long, stiff and persistent; caryopsis somewhat compressed; inner palea more or less deplanate or complicate on the back, or at least towards the apex 2-carinate . . . . . *Cephalostachyum.*

†† Caryopsis the size of a wood-apple and irregular globular.

Inner palea deplanate and boat-shaped; large semi-scandent bamboos . . . . . *Pseudostachyum.*

○ ○ Inner palea concave or convolute.

+ Caryopsis very large, thick-fleshy, acuminate-beaked.

Inner palea convolute; stamens 6; arboreous, rarely shrubby bamboos . . . . . *Melocanna.*

++ Caryopsis rather small, dry and rapidly coriaceous.

Inner palea convolute, long; caryopsis somewhat compressed, very long-beaked; erect arboreous bamboos, rarely shrubby . *Schizostachyum.*

Inner palea concave, short; caryopsis terete, ovate, acuminate; climbing bamboos . . . . . *Dinochloa.*

ARUNDINARIA, P. d. B.

Spikelets 2- many-flowered, in terminal or lateral lax or contracted panicles or racemes, rarely solitary or few, the florets imbricately distichous, the upper ones imperfect with a rudimentary terminal one, the pedicels (*rachillæ*) all or only few of them elongate, jointed, persistent or more usually deciduous. Glumes 2, distinct, or the lower one aborted, the upper ones always shorter. Valves 2, the inner one 2-keeled on the depressed or channelled back. Stamens always 3. Lodicules 3. Stigmas sessile or nearly so, 2-3, plumose. Caryopse sessile, oval to linear-oblong, more or less terete, with a furrow along the front.—Shrubby tufted grasses usually not above 15-20 ft. high, with thin stems. Leaves often small, more or less tesselated, persistent during flowering or deciduous.

1. **A. elegans,** Kz.—An evergreen slender, tufted, shrubby bamboo ($12—20+(?)+\frac{1}{10}—\frac{1}{5}$), the stems green or blackish, alternately half-terete; leaves linear, long-acuminate, contracted at the obtuse

base into a very short petiole, rigidly chartaceous, 4-5 in. long by ⅓-½ broad, somewhat glaucescent beneath, with about 4 nerves at each side, conspicuously tesselate and (especially towards the apex) spinulose-rough along the cartilaginous margins; sheaths of the leaves channelled, glabrous, with a few stiff hairs at the outer corner of the truncate mouth; shoot-sheaths chartaceous, sparingly and minutely tawny-hispid, minutely pale ciliolate along the margins, minutely auricled at the narrowed naked mouth, the ligule narrow, ciliolate; spikelets often steel-blue on the sunny side, long and slender (½-1 in.) -pedicelled, 1½-1 in. long, very variable in the number of florets (4-14), and forming a glabrous, narrow, panicle-like raceme at the end of the leafy branchlets; glumes 2, the outer one 3-3½ lin. long, linear, acuminate, keeled, the inner one narrower and somewhat shorter; rachillæ about 2 lin. long, minutely silky-pubescent, bearded at the joints; outer palea nearly 4 lin. long, compressed-concave, lanceolate, cuspidate-acuminate, smooth and glossy, the nerves faint; inner palea a little shorter, compressed-boat-shaped, slightly pilose along the keels towards the 2-cleft apex of the channeled back; lodicules 2, fringed; stigmas white; anthers purple.

Hab.—Frequent in the damp hill forests and in the stunted forests of the Nattoung hills, Martaban, east of Tounghoo, at 5,000 to 7,200 ft. elevation; also Ava, Kakhyen hills.—Fl. March.—s.—SS.=Metam.

BAMBUSA, Schreb.

Spikelets 5- many- flowered, compressed, depressed or cylindrical, usually clustered and spiked, forming at length a gigantic leafless radical panicle. Florets distichous, the upper and lower ones incomplete, or the lower replaced by a rudimentary spikelet or altogether empty. Glumes none or several and conform to the paleas, but smaller. Rachillæ more or less abbreviate. Inner palea of the hermaphrodite floret 2-keeled on the deplanate or concave back, usually somewhat shorter than the outer one. Lodicules 3 or fewer, or none. Stamens 6, the filaments long and free. Ovary naked, the style elongate, simple or 2-3-parted, caducous. Caryopsis oblong to elliptical, with a membranous testa, mucronate.—Arboreous or rarely shrubby tufted bamboos, up to 120 ft. high, with more or less alternately fascicled branches and usually rapidly or slowly dying after flowering.

○ *Stigmas white.—Unarmed bamboos.*

× *Shoot-sheaths not or obscurely auricled at the mouth.*

Small bamboo; leaves small, glabrous, whitish pruinous beneath . *B. nana.*

×× *Shoot-sheaths conspicuously auricled or the blade decurrent into an auricle-shaped appendage.*

\+ *Auricles polished and smooth, without fringes.*

Mouth of leaf-sheaths long-produced, the ligule as much produced and as long as the petiole . . . . . *B. affinis.*

\+ + *Auricles large, strongly fringed.—Unarmed bamboos.*

Shoot-sheaths green and striped, the appressed bristles brown; anthers purple or brown-purple; angles of inner palea white-ciliate . . . . . *B. vulgaris.*

Shoot-sheaths white-powdered or almost pruinose, the appressed bristles scanty, brown; anthers yellow; angles of inner palea ciliate . . . . . *B. tulda.*

Shoot-sheaths green and yellow, the appressed bristles white; anthers purple; angles of inner palea quite smooth . . . *B. polymorpha.*

Doubtful, flowers unknown; leaves whitish-glaucous and pubescent beneath; leaf-sheaths long and slenderly caudiculate . . *B. villosula.*

○ ○ *Stigmas purple.—Spiny bamboos.*

Shoot-sheaths glossy-smooth, purple to scarlet; leaves small; angles of inner palea tomentose-ciliate; anthers yellow . . . *B. arundinacea.*

1. **B. nana,** Roxb.—*Pa-lau-pinan-wa.*—An evergreen tufted, dense, much-branched bamboo (6—10 + (?) + $\frac{1}{10}$—$\frac{1}{5}$), the stems glabrous, green or coloured, the internodes about $\frac{1}{2}$ ft. long or longer, slightly thickened at the joints; shoot-sheaths green or yellowish, striate, glabrous, minutely or not auricled, but spuriously continuous with the erect, ovate-lanceolate, acuminate, membranous, green imperfect blade which is usually fringed with a few brown stiff hairs along its lower part, the ligule very narrow, entire; leaves thin-chartaceous, linear-lanceolate to lanceolate, acuminate, narrowed with a rounded or slightly tapering base in a very short petiole, rough-bordered, glabrous, whitish or glaucous beneath, lateral veins 3-4 on each side, faint; leaf-sheaths glossy, striate, shortly fringed on the minutely auricled or naked mouth; spikelets $\frac{1}{2}$-1 in. long, occasionally very elongate, 5- many-flowered, solitary or few together along the end-branchlets or at length forming a poor diffuse panicle; florets nearly all hermaphrodite or very rarely the lowermost reduced to an empty palea; rachillæ glabrous; outer palea convolute-terete, smooth, rather acute, the inner one acute, deplanate on the back, with smooth angles; lodicules 3, longer than the ovary, entire; filaments elongate, exserted; anthers yellowish, with purplish streaks, pendulous; ovary globular-pear-shaped, rough at the apex; style very short, persistent; stigmas 3, pilose, white; caryopsis elliptical, sulcate, mucronulate.

Hab.—Rarely cultivated in and around Rangoon and elsewhere.

2. **B. affinis,** Munr.—*Thaik-wa.*—An evergreen low, tufted, bushy bamboo (15—20 + 0 + $\frac{1}{3}$—$\frac{1}{4}$), the stems green and whitish, striate, the internodes $1\frac{1}{4}$-2 ft. long, hollow, slightly thickened at the joints; shoots solid, whitish hispid, glabrescent, the sheaths green or yellowish green, hardly puberulous, along their sides appressed brown-setose and glabrescent, with smooth borders, bordered with a narrow intensely green polished appendage at the somewhat produced obliquely truncate mouth, the ligule rounded and

produced, at length turning very short, entire, the imperfect blade linear-lanceolate, small, acuminate, green, afterwards reflexed, minutely hispid above, smooth beneath, the margins serrulate-rough; leaves lanceolate, 4-6 in. long, long-acuminate, at the rounded base contracted in a 1-2 lin. long petiole, above retrorsely rough towards and on the margins, somewhat rough and rather glaucescent beneath, the 4-8 or rarely more nerves at each side thin but conspicuous; sheaths glabrous, sulcate in a dried state, much produced and nude at their mouth, and here furnished with a conspicuous, oblique, entire, or toothed-ruptured ligule up to a line broad; spikelets few, clustered, coriaceous, glossy, almost an inch long, 6-10-flowered, pale brown, forming a terminal, interrupted, almost simple spike or panicle; rachillæ rather short, shortly bearded at the apex; outer palea more than 20-nerved, long-acuminate, the inner one 7-nerved between the 2 fringed angles of the depressed back; lodicules 3, rather thick, the 2 larger ones often united; ovary almost obovate, nearly hairy at the apex and tapering into a 3-cleft style.

Hab.—In the Eng forests of Martaban, east of the Sittang.

3. **B. tulda,** Roxb.; Brand. For. Fl., 566.—*Thaik-wa.*—An evergreen, tufted, arboreous bamboo often shedding leaves in drier districts (40—60+ (?) +⅔—1), the stems narrow-fistulose, strong, green, hardly glossy, the internodes 1½ ft. long, the lowermost ones fibrous-annulate at the joints; shoots green, glabrous, their sheaths green, whitish-powdered or almost pruinous, more or less thinly covered with dark-brown appressed bristles, on the margins indistinctly or almost not ciliolate, the imperfect blade broadly ovate, cuspidate, coriaceous, erect, minutely retrorse-hispid inside, decurrent into a large purplish or yellowish fringed contiguous or sinuately separated waved auricle, the ligule narrow, entire; leaves oblong to linear-lanceolate, 7-9 in. long by ¾-1½ broad, short-petioled, with a rounded base, acuminate, glaucescent and puberulous beneath, turning rough (more so on the borders), the 7-9 lateral nerves on each side conspicuous; sheaths glabrous, or rarely hairy on the back towards the apex, deciduously and long whitish-fringed on the minutely auricled produced mouth; panicle consisting of interrupted spikes, gradually becoming gigantic and radical after the fall of the leaves; spikelets clustered by 2 or 3 or many, 1-2½ in. long, linear-lanceolate, acuminate, depressed, supported by a few dry chartaceous small bracts, the lower 2 or 3 paleas gemmiparous, all the others hermaphrodite or rarely one or the other of the lower ones male; rachillæ smooth; outer palea of hermaphrodite flowers concave-oblong, acuminate, smooth and glossy green; inner palea somewhat shorter, smooth, white-fringed along the angles of the 2-keeled back; lodicules 3, long and tenderly fringed;

anthers yellow, almost truncate or blunt; ovary obovate, white-hispid on the apex; style short, 3-cleft or rarely simple by arrest; stigmas long, white, pilose; caryopsis oblong or oval, hirsute on the apex.

HAB.—Frequent in the open, especially the Eng forests, all over Pegu and Martaban down to Tenasserim; also Arracan; rare along choungs in the dry forests of Prome; cultivated in Chittagong and elsewhere.—Fl. Fr. H.S.—1.—SS.=Arg. *Dil.*

4. **B.** (?) **villosula,** Kz.—An almost simple-stemmed rarely tufted bamboo, the stems arising usually singly from the stock, of the thickness of the human arm, the internodes 1-1¼ ft. long, equal at the joints; shoot-sheaths truncate, ciliate on the margin, glabrous outside, "without an imperfect blade;" leaves linear, narrowed or rounded at the base, 5-8 in. long by ½-¾ broad, acuminate, very shortly petioled, above and on the margins scabrous, glaucescent-green, beneath pubescent, whitish glaucous, villous towards the petiole, lateral veins little conspicuous, 5-6 on each side; leaf-sheaths minutely villous, glabrescent, whitish ciliate on the margins, one side of the mouth produced in a rather long, thin, sparingly and rigidly fringed caudicle-like appendage, the other hardly auricled and furnished with a few small bristles; rest unknown.—(Partially after Brandis.)

HAB.—On limestone hills of Martaban and Upper Tenasserim.—Ca. (This seems to be the true *tabeindein-wa.*)

5. **B. polymorpha,** Munr.—*Kya-thoun-wa.*—An evergreen and arboreous tufted bamboo (50—70 + (?) + 1½), often leaf-shedding in drier districts or in unusually dry seasons, the stems fistulose (the wood about ½ in. thick), strong, greyish tomentose, the internodes about 2 ft. long, the lower ones regularly fibrous-rooted at the joints; shoots tomentose, their sheaths remarkably short and only ⅓ the length of the internodes, fragile-coriaceous, reddish green to yellow, greyish from appressed stiff white bristles, the imperfect blade concave-ovate, almost cuspidate, erect, towards the base fringed and extending into an elongate large waved falcate-oblong auricle fringed by strong curved pale-brown 3-4 lin. long bristles, the ligule narrow, entire; leaves small, linear, unequal at the base and narrowed in a very short petiole, long-acuminate, 4-6 in. long by ⅓-½ broad, thin-chartaceous, retrorsely rough above and more so along the margins, glabrous, glaucous green, the 4-6 nerves at each side faint; sheaths glabrous, hardly produced at the mouth, and here furnished with a minute auricle bearing a few stiff rather long bristles; spikelets depressed, with 3-5 small empty glumes at the base, polished

and usually steel-blue on the sunny side, 4-6-flowered, about $\frac{1}{3}$-$\frac{1}{2}$ in. long, forming slender glabrous spikes, soon transforming into an immense radical panicle after the shedding of the leaves, the lower 1-2 florets reduced to empty paleas, the upper one female with a long-pedicelled rudimentary floret; outer palea of hermaphrodite flowers concave-lanceolate, about 3 lin. long, bluntish with a dorsal point, polished, the inner palea almost longer, truncate at the apex, lanceolate-boat-shaped, depressed on the back, with the angles quite smooth; anthers purple; lodicules obovate-securiform, ciliate; ovary obovate-club-shaped, puberulous at the apex; styles 3 (?), white-pilose; caryopsis oblong, flattened on the back, with a flat rather acute apex, about $2\frac{1}{2}$ lin. long.

Hab.—Common in the upper mixed forests of the Pegu Yomah and Martaban.—Fl. Fr. H.S.—l.—SS.=*SiS.* Metam.

6. **B. arundinacea,** Willd.; Bedd. Sylv. Madr., 231, t. 321; Brand. For. Fl., 64.—*Kya-kat-wa.*—An arboreous tufted bamboo (30—70 + 0 + $\frac{1}{2}$—1), shedding leaves in H.S., the branchlets armed with recurved smaller or larger spines (abortive branchlets), the stems narrow fistulose, very strong, glossy green, the internodes rather short, slightly thickened at the joints; shoots green, glabrous, their sheaths quite smooth and glossy, violet to fuscous-purple (or the uppermost ones often bright orange or scarlet), sometimes striate, the margins fugaceously retrorse-ciliate, the imperfect blade broadly ovate, acute, concave with involute margins, coriaceous, smooth outside, thickly appressed blackish bristly inside, at the base decurrent into a waved-plaited large auricle, the ligule narrow, tomentose-fringed; leaves linear to linear-lanceolate, acuminate, rounded or almost tapering at the base, very shortly petioled, 3-6 in. long by $\frac{3}{4}$-$1\frac{1}{4}$ broad, stiff-chartaceous, somewhat rough on the margins, glabrous or shortly puberulous beneath, the 4 nerves at each side faint; sheaths puberulous or, especially towards the apex, pubescent, glabrescent, almost truncate or hardly produced at the mouth, terminating in a minute auricle furnished with a few white fugaceous bristles; spikelets loosely clustered, lanceolate, acute, 6-7-flowered, often somewhat curved or twisted, clustered and spiked, formin an immense radical panicle after the fall of the leaves; florets laxly distichous, the lower 2-1 reduced to gemmiparous paleas, the following all hermaphrodite, the last but one rudimentary and male; outer palea of hermaphrodite florets broadly lanceolate, acute, smooth and rather glossy, the interior palea rather longer, puberulous, glabrescent, tomentose-ciliate on the angles of the deplanate 2-keeled back; anthers yellow; lodicules fringed; stigmas purplish pilose; caryopsis 2 lin. long, ovoid-elliptical, depressed on the back, bulbous-acute.

HAB.—Common in the larger alluvial plains and forming forests, especially in the neighbourhood of streams, all over Pegu and Martaban down to Tenasserim; also Chittagong.—Fl. Fr. H.S.—l.—SS.=All.

GIGANTOCHLOA, Kz.

Inflorescence glomerate-spiked, usually transformed in an immense radical panicle after the fall of the leaves. Spikelets crowdedly 5-many-flowered, somewhat compressed or cylindrical, imperfect downwards and often also upwards, the lower paleas very shortened, the upper ones gradually longer. Glumes none or conform to the lower paleas. Inner palea of fertile florets boat-shaped, on the back flattened or concave with 2 sharp margins, usually somewhat shorter than the outer concave or convolute one. Lodicules none or incomplete. Stamens 6, but occasionally 7-9, the filaments united in a tube and exserted. Ovary membranous, the style simple or 2-3-parted, caducous. Caryopsis oblong to elongate-oblong, with a membranous pericarp, usually furrowed on the inner side, mucronate from the persistent style-base.—Tufted arboreous bamboos often gigantic and up to 120 and even 150 ft. high and higher, the stems often columnar and almost branchless for $\frac{1}{3}$ of their length or branched already from the base, usually dying off after flowering.

× Spikelets white-hairy; stigmas white.

Shoot-sheaths almost 4 times shorter than the internodes, spreadingly tawny-hispid; ligule nearly $\frac{1}{2}$ in. long, erose-toothed; angles of inner palea white-pilose; anthers yellow . . *G. albo-ciliata.*

× × Spikelets black or brown hairy.

Spikelets $\frac{3}{4}$-1 in. long; shoot-sheaths densely appressed black-setose on the sides; auricle smooth and polished, nude . *G. Andamanica.*

As former, but sheaths sparingly tawny setose . . . . *G. auriculata.*

Spikelets $1\frac{1}{2}$-2 in. long; shoot-sheaths densely appressed black setose; auricles large, strongly tawny-fringed; anthers purple; stigmas white . . . . . *G. macrostachya.*

1. **G. albo-ciliata** (*Oxytenanthera albociliata*, Munr.).—*Wahpyu-ka-le.*—An evergreen densely tufted bamboo (20—30 + 0 + $\frac{1}{3}$—$\frac{1}{2}$), often shedding leaves in drier seasons, the stems elongate arcuate-decurved, spreading, narrow fistulose, greyish green and a little hispid from white minute bristles (especially while young and solid), the wood about 3 lin. strong, the internodes $1\frac{1}{2}$-2 ft. long (the basilar ones shorter), prominently annulate at the joints, the branches usually erect and almost solitary and nearly as strong as the stem itself; shoot-sheaths almost 4 times shorter than the internodes, spreadingly tawny-hispid, almost truncate at the mouth, at the one side slightly produced in an indistinct auricle, the imperfect blade lanceolate, acuminate, membranous, spreading, the ligule very large, nearly $\frac{1}{2}$ in. long, half-orbicular or lunate, erose-toothed; leaves lanceolate, at the rounded or obtuse base contracted in a very short

(about a line long) petiole, 6-8 in. long by ⅔-1 broad, chartaceous, subulate-acuminate, glabrous, rough along the margins, especially towards the apex, glaucescent beneath; spikelets elongate-linear, slightly or not compressed, more or less curved, rarely straight, acuminate, glaucous-green, ¾-1 in. long, compactly 3-5-flowered, densely clustered, interruptedly spiked, gradually forming radical large panicles with the fall of the leaves, the lower paleas empty and much shortened, usually the terminal one hermaphrodite, the remaining 1 or 2 males; outer palea of the hermaphrodite florets linear-lanceolate, convolute, acuminate, the margins conspicuously and elegantly white-fimbriate; the inner palea elongate and narrow, much shorter, pilose at the bluntish apex, white-ciliate along the angles of the deplanate back; anthers bristly acuminate, greenish yellow; ovary rough at the apex; style simple, the stigmas white; caryopse elongate-oblong, cylindrical, stylose-acuminate.

Hab.—Common in the mixed forests, especially the lower ones, but not entering the savannahs, all over Pegu and Martaban down to Tenasserim.—Fl. Fr. C.S. & H.S.—l.+s.—SS.=SiS. Metam. All.

2. **G. Andamanica,** Kz.—An evergreen tufted bamboo (20—30 + 0 + ⅓—¼), the stems rather hollow, glaucous-green, glabrous; shoot-sheaths green, fugaceously appressed dark-brown hispid, and similarly ciliate on the margins, at the nearly truncate mouth bordered with a nude very narrow glossy green, at the end rounded auricle extending sometimes to the base of the spreading, herbaceous, linear imperfect blade which is sparingly dark-brown bristly above, the ligule narrow, almost entire; leaves lanceolate, at the base rounded or rarely truncate and contracted in a short (1-1½ lin. long) petiole, long-acuminate, 6-10 in. long or longer by 1-1½ broad, glabrous, somewhat rough on the margins, glaucescent beneath, the 9-10 nerves at each side faint; sheaths appressed fuscous-hispid, soon turning glabrous, at the one side of the produced mouth bordered by a rounded, nude, intensely green and glossy auricle, at the other side almost nude, the ligule very narrow and inconspicuous; spikelets cylindrically linear, more or less curved or straight, ⅔-1 in. long, crowdedly 6-7-flowered, clustered, in interrupted spikes forming gradually a large radical panicle with the fall of the leaves; the outer paleas conspicuously blackish brown fringed, the lower 3 much shortened and empty, the last two or one but one usually hermaphrodite-female, the uppermost one hermaphrodite and often enclosing a terminal rudimentary floret; the inner palea narrow boat-shaped, 2-toothed at the bristly apex, minutely pale ciliate along the angles of the depressed back; anthers purple, terminating in a long bristle; style simple, stiff, shortly hirsute, the stigma somewhat thickened, white-pilose.

Hab.—Common in the mixed forests of the Andamans, and forming often jungles.—Fl. Apr.-May.—l. + s.—SS.=Metam. SiS.

3. **G. auriculata,** Kz.—*Ta-la-ku-wa.*—An evergreen arboreous tufted bamboo (30—40 + ? + ½—1), the stems narrow-fistulose, very strong, glossy green; shoots green, glossy, their sheaths glaucous-green, on both sides (especially upwards) densely covered with appressed, blackish brown, rarely tawny bristles, the margins brown- or blackish-ciliate, the mouth hardly produced and terminated by a small polished intensely green naked auricle, the imperfect blade usually as long or longer than the sheath itself, erect, lanceolate to broadly lanceolate, acuminate, chartaceous, outside on the back marked with 2 longitudinal streakes of blackish brown appressed bristles, the ligule narrow, entire; leaves lanceolate or linear-lanceolate, rounded or tapering at the base, acuminate, shortly acuminate, chartaceous, ¾-1¼ ft. long by 1-2½ broad, with rough margins, beneath minutely puberulous and at length becoming somewhat rough, the 8-12 nerves at each side conspicuous; sheaths green, towards the apex fugaceously appressed white-silky, glabrescent and even becoming glossy, the mouth produced in a nude, thick, polished, intensely green auricle; rest unknown; may eventually turn out to be identical with the preceding species.

Hab.—In the low forests of Southern Pegu, rather rare; cultivated in villages of Arracan and Chittagong.—s+l.—SS.=Dil. Arg.

4. **G. macrostachya,** Kz.—*Wa-net.*—An evergreen arboreous tufted bamboo branched already from the base (30—50+0+⅓—¼), the stems amply fistulose (the wood 3 lin. thick), dark-green, the internodes annulate, but hardly thickened at the joints, 2-2½ ft. long (the lower ones somewhat shorter); shoot-sheaths very short, 5-8 in. long, densely appressed-blackish-setose, ciliate along the margins, the imperfect blade (erect-spreading?) broadly lanceolate, appressed-setose above, convolute-acuminate, the base decurrent into large waved fuscous-fringed auricles produced at the rounded ends, the ligule very narrow, entire or obsoletely toothed; leaves lanceolate, at the base obtuse or almost rounded and contracted in a short (1 lin.) petiole, 5-7 in. long by ½-¾ broad or broader, long-acuminate, chartaceous, retrorsely rough on the margins, whitish and minutely and softly puberulous beneath, the 5-7 nerves at each side very faint; sheaths spreadingly hirsute, soon glabrescent, at the one side of the somewhat produced mouth minutely auricled, and sparingly but long (2-3 lin.) fringed, the ligule inconspicuous; spikelets sessile (rarely and only occasionally the one or other peduncled), 1½-2 in. long, linear and slightly compressed, 6-7-flowered, straight or rarely curved, subulate-acuminate, laxly clustered, in interrupted spikes, with the fall of the leaves passing gradually into a radical immense panicle, the outer paleas all strongly blackish hispid-fringed, the lower 3 or 4 shortened and

empty, the 3 upper ones hermaphrodite; outer palea of the hermaphrodite florets linear-lanceolate, convolute, subulate-acuminate, the inner palea very narrow boat-shaped, especially upwards along the angles of the deplanate back purplish black, ciliate, hardly 2-cleft at the apex; anthers purple, bristly acuminate; ovary and the simple long style hirsute, the stigma white.

HAB.—Not unfrequent in the tropical forests of Martaban and Tenasserim; also cultivated in villages of the Irrawaddi valley and of Arracan.—s.—SS.= Metam. SiS., etc.

DENDROCALAMUS, NE.

Characters those of *Bambusa*, but the pericarp of the caryopsis coriaceous or hard; habit and stature the same.

× Outer paleas terminated by a longer or shorter pungent bristle or point; anthers yellow; stigmas purple.

Shoot-sheaths more or less pruinose, slightly tawny appressed setose, the mouth truncate; angles of inner palea fringed; bristle of outer palea nearly 2 lin. long; spikelets hairy or smooth . . . . . *D. strictus.*

Shoot-sheaths minutely appressed-silvery-setose, auricles large, bristly-fringed, one turned upwards, the other downwards . *D. criticus.*

Shoot-sheaths appressed dark-brown-setose, auricle wavedly decurrent, stuppose-setose inside; angles of inner palea ciliate; outer palea pungent-pointed . . . . . *D. membranaceus.*

× × Outer paleas cucullate-mucronate, but not pungent; spikelets green, membranous.

○ Spikelets only 2½-4 lin. long; anthers yellow; stigmas purple.

Shoot-sheaths appressed-tawny-setose, auricles waved-decurrent, stuppose-fringed inside; ligule narrow, angles of inner palea minutely ciliate . . . . . *D. Brandisii.*

Shoot-sheaths narrow and nearly as long as the internodes, appressed dark-brown-setose, only at one side of the mouth with a small nude auricle; ligule conspicuous, bristly-fimbriate; angles of inner palea slightly pilose . . . . . *D. longispathus.*

○ ○ Spikelets rather large, 6-7 lin. long or longer; leaves very large; shoot-sheaths not known.

Mouth of leaf-sheaths not produced in an auricle, the ligule conspicuous, entire or fimbriate; angles of inner palea white-fringed; anthers yellow; stigma purple . . . . *D. calostachyus.*

Mouth of leaf-sheaths with large lunate strong fimbriate auricles, ligule large, usually ruptured; angles of inner palea smooth, lodicules long fimbriate . . . . . *D. Griffithianus.*

1. **D. strictus**, NE.; Bedd. Sylv. Madr., 235, t. 325; Brand. For. Fl., 569, t. 70.—*Myin-wa.*—A leaf-shedding arboreous tufted bamboo (30—50 + 0 + ¼—½), the stems narrow-fistulose, while young nearly solid, green, the internodes about a foot long, much thickened at their joints; shoot-sheaths yellowish green, more or less pruinous and glabrescent, glabrous or sparingly appressed brown-setose, the narrow-truncate mouth sparingly fringed and almost continuous with the erect, acuminate, almost coriaceous, glabrous

imperfect blade, the ligule very narrow, entire or minutely white-ciliate; leaves linear to linear-lanceolate, acuminate, at the base rounded or nearly so, and narrowed into a 2-3 lin. long petiole, chartaceous, 4-10 in. long by ½-1 broad, above, especially towards and on the margins, rough, beneath softly puberulous, turning rough, the 5-9 nerves at each side faint; sheaths variable as to indumentum, from hirsute to puberulous and glabrescent, hardly produced at the minutely auricled sparingly fringed mouth; spikelets ovate, slightly compressed, 5-6-flowered, 4-5 lin. long, very variable in indument, from hirsute to almost glabrous and glossy, many together and densely clustered, in interrupted spikes at the ends of the leafy branches, the lower 2 or 3 paleas empty, the following 2 hermaphrodite; rachillae very short, persistent; outer palea of hermaphrodite florets concave-ovate, 4-5 lin. long, chartaceous, nerved, minutely ciliate or nude, especially towards the keeled apex hirsute, pubescent or rarely wholly smooth and glabrous or only roughish, terminating in a sharp, subulate, stiff bristle nearly a line long; inner palea fringed along the margins and the angles of the depressed back; anthers yellow or greenish yellow, blunt; ovary and style-base minutely hirsute; style very long, 2-cleft at the apex, the stigmas purple; caryopsis elliptically ovoid, about 3 lin. long, glossy brown, crowned by the long subulate hairy style-base.

Hab.—Common in the Eng, dry and drier upper mixed forests, all over Burma from Ava and Martaban down to Pegu and Upper Tenasserim.—Fl. Fr. H.S.—l.—SS.=*CaS. SiS.* Dil.

2. **D. criticus,** Kz.—An evergreen arboreous tufted bamboo (15—30 + 0 + ⅓—⅔), the stems amply fistulose, weak, the internodes about a foot long, while young appressed whitish puberulous; shoot-sheaths large, covered with minute silvery appressed bristles, almost truncate at the mouth, the imperfect blade lanceolate, convolute-acuminate, similarly appressed silky-bristly outside as the sheath, not narrowed at the base and extended into conspicuous falcate-oblong bristly fringed auricles about ⅓ in. long, the one directed upwards, the other downwards; leaves linear-lanceolate, often somewhat oblique at the truncate base, on a short about a line long petiole (the upper ones almost sessile), 4-8 in. long by ½-1 broad, long-acuminate, thin-chartaceous, sparingly and roughish hairy beneath, rough along the margins, the 5-7 nerves at each side of the midrib faint but conspicuous; sheaths glabrous (?) (probably hirsute while young), not produced at the mouth and here furnished with a thickened long- (hairs 2-4 lin. long) fringed auricle; rest unknown.

Hab.—Apparently restricted to the shady side of the summit of the Kambalatoung, Prome Yomah, at about 3,000 ft. elevation.—s.—SS.=CaS.

3. **D. membranaceus,** Munr.—*Wa-yai.*—An evergreen arboreous tufted bamboo (40—50 + 0 + ⅓—¼), the stems green, whitish powdery below the strongly annulate joints, branched already from the base, the internodes about ¾-1 ft. (the basal ones 4-6 in.) long; shoot-sheaths very similar to those of *B. Brandisii,* almost as long as the internodes, appressed dark-brown-setose, and similarly retrorse-ciliate along the margins, the imperfect blade reflexed, appressed dark-brown-setose inside, broadly lanceolate, long-acuminate, somewhat tapering towards the shortly waved-decurrent base, which is stuppose-setose inside, the ligule up to 2 lin. broad, erose; leaves small, lanceolate, 4-5 in. long by ⅓-½ broad, bristly acuminate, at the rounded or obtuse base contracted into a petiole of 1 lin. length, retrorsely rough along the margins and towards the apex, otherwise glabrous, glaucescent beneath, the 4 nerves at each side of the midrib thin but conspicuous; sheaths glabrous, at the one side of the very slightly produced mouth armed with 1 or another short bristle; spikelets very slightly compressed, glossy, glabrous, 3-4 lin. long, crowdedly 4-5-flowered, in dense clusters and interruptedly spiked, and as the leaves fall they form gradually an immense radical glabrous panicle; the lower 2 or 3 paleas empty, the following 2 or 3 hermaphrodite, with or without a terminal rudimentary one; outer palea of hermaphrodite florets broadly concave-oblong, mucronulate, smooth and glossy, the inner palea shorter, ciliate along the angles of the depressed back; anthers apiculate, yellow; ovary and the long simple style hirsute, the stigmas purple; caryopsis ovate, contracted at the base, nearly 2 lin. long, glossy, the apex and the persistent style-base slightly hirsute.

Hab.—Not unfrequent in the tropical forests of Martaban.—Fl. Fr. March. —s + l.—SS.=Metam.

4. **D. Brandisii,** Munr.—*Kya-lo-wa* or *Wa-bo.*—An evergreen gigantic tufted bamboo (60—120 + (?) + 2½), the stems greyish tomentose, the internodes 1-1¼ ft. long (the wood 1 in. thick or thicker), the lower ones fibrous-annulate on the slightly thickened joints; shoot-sheaths fragile, coriaceous, up to 2 ft. long, appressed tawny-setose and similarly fringed along the margins; imperfect blade spreading or reflexed, broadly lanceolate and often somewhat narrowed at the base, and here shortly waved-decurrent and stuppose-hispid inside, the ligule narrow, obsoletely erose; leaves broadly lanceolate, ½-1 ft. long by 1-1½ and even 2 broad, long-acuminate, slightly rounded at the base and decurrent on the short petiole, softly and minutely puberulous beneath, but soon turning retrorsely roughish, rough on the margins, the 12-15 nerves at each side of the petiole thin but conspicuous; sheaths while very young pubescent, soon quite glabrous, long-produced at the mouth and here furnished with a few long bristles, the ligule conspicuous and long,

rounded (rarely in abnormal branch-shoots hirsute, with a short ciliate ligule) ; spikelets remarkably small, only 3-4 lin. long, 4-5-flowered, green when fresh, glossy, many clustered together, in interrupted spikes, forming gradually an immense radical panicle with the fall of the leaves ; the lower paleas shorter and empty, the 2 or 3 upper ones hermaphrodite, the outer palea concave-ovate, incurved-mucronate, polished, the inner one much shorter, broadly boat-shaped-lanceolate, minutely ciliate along the margins and along the 2 keels of the depressed back, blunt with 2 minute points ; anthers greenish yellow, spuriously 4-celled, acuminate ; filaments short, free ; ovary and the simple style hirsute, the plumose stigmas violet ; caryopsis about $1\frac{1}{2}$ lin. long, oval, white-pubescent at the apex, cartilaginous, terminating in the fragile hirsute style.

Hab.—Common in the tropical forests of the eastern slopes of the Pegu Yomah and of Martaban, up to 3,500 ft. elevation.—Fl. Fr. H.S.—s.—SS. = *Metam.* SiS.

5. **D. longispathus,** Kz.—*Wa-ya.*—An evergreen tufted bamboo (40—60 + 0 + $\frac{1}{3}$—$\frac{1}{4}$), the stems greyish green, amply hollow, the internodes about $1\frac{1}{2}$-2 ft. long, slightly thickened and often rooting at the joints ; shoot-sheaths very long and narrow, not embracing the internodes at the upper part, about $1\frac{1}{4}$-$1\frac{1}{2}$ ft. long, appressed dark-brown-setose and similarly retrorsely ciliate along the margins, at one side of the narrowed mouth with a short, rounded, nude, membranous auricle, the imperfect blade linear-lanceolate, long-acuminate, membranous, reflexed, the ligule conspicuous, but rather narrow, long and coarsely dark brown or tawny-bristly fimbriate ; leaves lanceolate to linear-lanceolate, 6-8 in. long by $\frac{3}{4}$ to 1 broad, long-acuminate, more or less tapering or obtuse at the base and contracted in a very short petiole or almost sessile, chartaceous, glaucescent beneath, slightly rough, but soon smooth, except on the margins, the 7 or 8 nerves at each side of the midrib faint, but visible ; sheaths glabrous, somewhat produced at the nude mouth, the narrow ligule rather conspicuous, fringed ; spikelets very small and truncate, about $2\frac{1}{2}$-3 lin. long, narrower at the base, broadest at the apex, rather densely and divaricately 5-flowered, in dense small clusters, interruptedly spiked, and as the leaves fall forming gradually an immense radical panicle ; the lower smaller 2 paleas empty or gemmiparous, the 3 upper ones fertile ; outer palea of hermaphrodite florets obovate-orbicular, acute, nearly 3 lin. long, glossy, the inner one nearly as long, narrowly boat-shaped, slightly pilose along the angles of the concave depressed back ; anthers mucronate, yellow ; style long, persistent, shortly 2-cleft, like the ovary hirsute, the stigmas purple.

Hab.—Frequent along choungs, in the moister upper mixed forests and also in the tropical forests of Arracan, Pegu Yomah, and Martaban.—Fl. C.S. & H. S.—s.—SS. = *SiS.* Metam.

6. **D. calostachyus,** Kz.—An evergreen (?) tufted bamboo, the sheaths of the branch-shoots appressed-fuscous-setose, white-fringed along the margins, truncate at the mouth and bordered all along by a narrow entire or almost entire ligule, the internodes fugaceously appressed-silvery-setose, thickened and annulate at the joints; leaves large, broadly lanceolate, ½-1 ft. long by 2-1 in. broad, rounded at the base and contracted into a very short (hardly a line long) petiole, sharply acuminate, rough on the margins and above towards the apex softly and shortly puberulous beneath, the 9-13 nerves at each side of the midrib faint, but visible; sheaths glabrous (?), conspicuously white-ciliate, not produced at the mouth, and here furnished with a conspicuous, entire, erose or fringed ligule; spikelets almost broadly oblong, slightly compressed, ½ in. long or somewhat longer, clustered, crowdedly 7-8-flowered, in elongate interrupted spikes forming an ample panicle, the end-branchlets alternately flattened and more or less puberulous; the lower 2 paleas shortened and empty, the following all perfect; outer palea of perfect florets broadly ovate, about 4-5 lin. long, smooth, acute, the inner palea oblong-boat-shaped, acute (those of the lower florets also blunt), slightly narrowed towards the base, shorter than the outer palea, puberulous or rarely almost glabrous on the depressed back and white-fringed along its angles and on the margins to the inflected sides; anthers yellow, rather long and smoothly mucronate; filaments free; ovary and the long style hirsute, the stigma simple, purple (?); lodicules 1 or 2, woolly fringed, minute.

Hab.—Ava, at Bhamo and on the Kakhyen hills east of it, at 3,500 ft. elevation.—Fl. Jan.-March.

7. **D. Griffithianus** (*Bambusa Griffithiana,* Munr.).—An evergreen (?) bamboo, the stems slender, almost scandent (?), fistulose; leaves large, 1-1½ ft. long by 2-3 in. broad, at the obtuse base narrowed into a very short strong petiole, subulate-acuminate, retrorsely rough along the margins towards the apex, in other respects glabrous, chartaceous, glaucous beneath, the 15-17 nerves at each side of the midrib thin, but conspicuous; sheaths apparently glabrous, glossy, furnished at both sides of the much-produced mouth with a large crescent-shaped reflexed auricle up to ⅔ in. long and strongly fringed, the ligule large, blunt, usually ruptured; spikelets cylindrical, 6-7 lin. long, crowdedly 5-flowered, clustered, in interrupted spikes, forming a glabrous (terminal) panicle; the lower 3 paleas empty, the last but one hermaphrodite, with a terminal long-pedicelled rudimentary floret; outer palea of hermaphrodite florets glabrous, minutely mucronate, the inner one nearly

as long, glabrous along the obtuse angles of the depressed back; lodicules 3, long-fringed, 2 of them longer and blunt; anthers blunt; style almost to the base 3-cleft, feathery; ovary with a glabrous beak.

Hab.—Ava, Mogoung.

CEPHALOSTACHYUM, Munro.

Inflorescence clustered, spiked, or in heads. Spikelets more or less terete, densely or remotely 3-5, flowered, compound, protected by bracts, the rachillæ shortened or elongate. Inner palea of hermaphrodite flowers more or less deplanate or complicate on the back or at least 2-keeled towards the apex, more or less embraced by the outer palea, some of the lower outer paleas gemmiparous, the buds developing at length into perfect spikelets and supplanting the deflorate or fruit-bearing older ones. Lodicules 3. Ovary and the long style indurated, flask-shaped and long-beaked, the inner tissue separating with maturity from the outer coriaceous or cartilagineous coat; stigmas three or rarely 2, rather short, pilose. Caryopsis crustaceous or coriaceous, long-beaked.—Bushy, tufted, often arboreous bamboos, the stems usually branching out far down. Inflorescence at the beginning terminal and spiked, gradually transforming into a radical leafless panicle and then soon dying off.

* *Spikelets very densely flowered, the rachillæ very short or reduced.*

○ *Spikelets* 12-14 *lin. long, in dense terminal heads.*

Spikelets glabrous (lodicules 5 lin. long?) . . . . . *C. pallidum.*

○ ○ *Spikelets* ½ *an in. long, more or less white-pilose, rarely glabrescent, in dense clusters, forming interrupted spikes or panicles.*

× *Stigmas white.*

Shoot-sheaths very short, black from dense appressed bristles; auricles large, stuppose-fringed; anthers purple, . . . *C. pergracile.*

Shoot-sheaths appressed white-setose; auricles large, long-fringed, one bent downwards, the other upwards; anthers pale-yellow . *C. flavescens.*

× × *Stigmas purple.*

Spikelets pilose, glabrescent; anthers yellow . . . . . *C. virgatum.*

* * *Spikelets glabrous, laxly and sometimes almost remotely flowered, the rachillæ more or less elongate (auricles of leaf-sheaths more or less elongate, long-white-fringed).*

Spikelets cylindrical, ½ in. long; inner palea smooth; anthers purple; stigmas white . . . . . *C. schizostachyoides.*

Spikelets almost pedicelled, 2-3 lin. long, almost remotely 7-3-flowered; inner palea on the keels at apex whitish-ciliate; anthers yellow . . . . . *C. Griffithii.*

1. C. pallidum, Munr.—Shrubby or almost arboreous; leaves lanceolate, 1-5 in. long by 5-10 lin. broad, rounded at the base, very long and setaceously acuminate, glabrous, rough above towards one side of the rough margin; sheaths glabrous, at the mouth

nude or fringed with much deciduous hairs, the ligule conspicuous; spikelets 12-14 lin. long, the fertile ones long-exserted, 3-flowered, pale-coloured, in terminal rather loose heads; the lower outer palea 3 lin. long, acuminate, many-nerved, the next fertile one an inch long, long-mucronate, thin-membranous, many-nerved, quite glabrous, except the hirsute furrow; lodicules narrow, lanceolate, "5 lin." long, shortly ciliate at the apex; ovary narrowed at the base, long-beaked (including the glabrous beak), 12-13 lin. long; "style shortly exserted, 2-cleft."—(After Munro.)

Hab.—Ava, common in the Patkaye range, at 5,000 ft. elevation.

2. **C. pergracile**, Munr.—*Tin-wa.*—A leaf-shedding arboreous, tufted bamboo (30—50 + (?) + $\frac{1}{3}$—$\frac{3}{4}$), the stems very hollow, glaucous-green, more or less whitish puberulous below the hardly thickened joints, the internodes 1-1$\frac{1}{2}$ ft. long; shoot-sheaths very short, only $\frac{1}{4}$-$\frac{1}{3}$ of the length of the internodes, brittle, brown, densely covered with black, more or less appressed, stiff bristles; the imperfect blade inflated, cordate-ovate, erect-spreading, coriaceous, convolute-acuminate, densely appressed-setose-villous inside, at the base extended into a broad, large, waved, stuppose-fringed appendage terminating in a falcate-oblong, rounded, fringed auricle, the ligule very narrow, entire; leaves lanceolate to broadly lanceolate, at the rounded or obtuse base contracted in a short broad petiole, subulate-acuminate, $\frac{1}{2}$-1 ft. long by 1-1$\frac{1}{2}$ in. broad, chartaceous, retrorsely rough on both sides and spinulose rough on the margins, glaucescent beneath, the 7-13 nerves at each side of the midrib rather conspicuous; sheaths glabrous or nearly so, the margins whitish ciliate, conspicuously membranously auricled at the mouth, and here fringed by numerous strong, pale-coloured, stiff, deciduous hairs up to $\frac{3}{4}$ in. long; spikelets bracted, $\frac{1}{2}$ in. long, linear-cylindrical, whitish hirsute, acuminate, 6-flowered, in dense, large, distant clusters along a filiform rachis or terminal, forming very slender, elongate, interrupted spikes gradually, passing, as the leaves fall, into a radical large panicle; the last floret but one hermaphrodite, enclosing the pedicel of a terminal abortive one, the next lower one reduced to an empty outer palea, the remaining lower paleas gemmiparous and developing gradually into perfect spikelets; outer palea hirsute, subulate-acuminate, the inner one sulcate towards the hirsute subulate-acuminate-point; lodicules 3, large, lanceolate, acuminate, entire; anthers purple; stigmas white; caryopsis obovate-oblong, nearly $\frac{1}{2}$ in. long, abruptly terminating in a straight beak of equal length, glossy brown.

Hab.—Common in the upper mixed forests, and often forming forests for itself, rare in the lower ones, all over Pegu and Martaban down to Tenasserim.—Fl. Fr. C.S. & H.S.—l.—SS.=*SiS.* Metam.

3. **C. flavescens**, Kz.—An evergreen tufted shrubby bamboo,

(10—15 + 0 + ¼) the stems usually yellow; shoot-sheaths brittle, covered with appressed whitish stiff bristles, the imperfect blade erect or nearly so, inflated-cordate, convolute-acuminate, at the base extended into a broad waved fimbriate appendage produced into 2, almost falcate, strongly fringed auricles, the one bent downwards, the other upwards, the ligule about 2 lin. broad, erose-toothed; leaves small, linear, 3-5 in. long by ⅓-½ broad, acuminate, at the rounded base contracted into a very short petiole, chartaceous, rough on the margins, especially towards the point, otherwise glabrous, the 4-5 nerves at each side of the midrib faint, but visible; sheaths glabrous, at the mouth hardly produced and furnished with a small thick auricle fringed by a few short deciduous bristles; spikelets cylindrically linear, acuminate, about ½ in. long, white-pilose, 3-flowered, densely clustered, and forming short but slender interrupted spikes or terminal on lateral branches, and as the leaves fall, gradually passing into a radical panicle; lower outer palea empty, the sequent hermaphrodite one accompanied by a rather long pedicel of a terminal abortive floret; inner and outer paleas almost conform, white-pilose, subulate-acuminate, the former almost deplanate on the back and 2-keeled towards the pilose point; lodicules 3, lanceolate, acuminate, minutely ciliate; anthers acute or blunt, first greenish and slightly purplish-dotted, then pale yellow; ovary elongate-flask-shaped, the apex and the 3-quetrous style sparingly pilose; stigmas 3, short, white-pilose.

Hab.—Introduced from Pegu into the Botanical Gardens at Calcutta.

4. **C. virgatum** (*Melocanna virgata*, Munr.).—Arboreous; sheaths and leaves unknown; spikelets cylindrically linear, acuminate, about ½ in. long, densely 4-flowered, bracted, glabrous, in lax clusters, forming interrupted spikes collected in a leafless panicle; the lower outer paleas gemmiparous, the next one empty, the last but one hermaphrodite and accompanied by a pedicel-like rudiment of the terminal floret; outer palea of hermaphrodite florets mucronate-acuminate, sparingly pilose and soon glabrescent, the inner one sulcate on the back, especially towards the 2-mucronate apex; lodicules 3, lanceolate, acuminate, slightly fringed; anthers yellow (?); stigmas plumose, purple.

Hab.—Mogoung.

5. **C. schizostachyoides**, Kz.—An evergreen arboreous tufted bamboo (20—30+ (?) +¾—1), the stems very hollow, green and glossy, the internodes 1½-2 ft. long, not thickened at the joints; leaves lanceolate to linear-lanceolate, rounded or almost narrowed at the base, on a 1-2 lin. long petiole, setaceously acuminate, 4-6 in. long by ½-1 broad, chartaceous, retrorsely rough towards the one margin and also towards the point, otherwise glabrous, the

lateral nerves faint and inconspicuous; sheaths hispid, but soon glabrescent, ciliate on the margins, at the mouth furnished with a more or less elongate falcate-linear auricle bordered on the upper edge with whitish stiff hairs ¼-½ in. long; spikelets linear-lanceolate, rather cylindrical, ½ in. long or somewhat longer, densely 5-flowered, in distant clusters, forming spikes gradually passing into a radical panicle with the fall of the leaves; the lower 2 paleas empty, the rest hermaphrodite, or the terminal one sometimes reduced to a rudimentary pedicel; outer palea broadly ovate, concave, shortly acuminate, roughish at the apex, the inner one depressed on the back and smooth, linear-lanceolate, acuminate; anthers purple, mucronate (the point roughish), spuriously 4-celled; ovary smooth with a firm style minutely hirsute at the apex; stigmas 3, purple; lodicules 3, lanceolate, blunt, minutely ciliate at the apex; caryopsis obliquely oblong, nearly 3 lin. long, smooth, terminated by a stiff, long, oblique beak.

Hab.—In the tropical forests of South Andaman.—Fl. Fr. Apr.-May.—s.—SS.=Metam.

6. **C. Griffithii** (*Teinostachyum Griffithii*, Munr.).—An evergreen (?) tufted arboreous bamboo about 20-25 ft. high; leaves linear-lanceolate or lanceolate, 4-6 in. long by ½-1 broad, rounded or narrowed at the base, very shortly petioled, acuminate, somewhat rough on the margins, especially towards the point, chartaceous, glabrous, or minutely puberulous on the glaucous or whitish undersurface, the 5-9 nerves at each side of the midrib faint, but conspicuous; sheaths glabrous, at the mouth terminated by a longer or shorter falcate auricle bordered on the upper margin with stiff bristles ¼-½ in. long; spikelets solitary or few together on shortened sheathed branchlets, almost pedicelled, elongate-linear, 2-3 in. long, somewhat terete, very laxly and almost remotely 7-3-flowered, glabrous, forming interrupted spikes and panicles; some of the lower paleas gemmiparous, the others all perfect and hermaphrodite with the exception of the 2 uppermost ones, which are more or less reduced or rudimentary, the rachillæ glabrous and elongate; the outer paleas smaller upwards and downwards, and passing gradually into the glume-like bractlets, those of the hermaphrodite florets convolute and closely embracing the base of the sequent rachilla, shortly cuspidate, glabrous; the inner palea somewhat longer, deplanate on the back and complicately 2-keeled, whitish ciliate on the keels towards the apex; lodicules 3, large, oblong-lanceolate, acuminate, glabrous; anthers spuriously 4-celled, notched at the apex, yellowish; ovary almost flask-shaped and constricted at the base, 3-gonous, smooth, the style 3-quetrous and much longer than the paleas; stigmas 3, feathery, white; caryopsis obliquely ovoid,

smooth and glossy, tapering at both ends, terminated by a very long stiff beak.

HAB.—Ava, in the forests of Wullaboom; also Chittagong.

PSEUDOSTACHYUM, Munro.

Inflorescence clustered-spiked or spreadingly panicled. Spikelets upwards and downwards incomplete, 4-6-flowered, the lower 1 or 2 paleas empty, the next 1 or 2 hermaphrodite, with a terminal 2-paleaceous pedicelled male or female floret. Inner palea deplanate on the back and boat-shaped. Lodicules 3, very large. Stamens 6; filaments free. Ovary indurated and coriaceous, obversely turbinate or flask-shaped, terminating in a strong beak-shaped style. Caryopsis very large, more or less globular, the pericarp thin and coriaceous. Seed large, mealy-fleshy.—Large, nearly scandent, tufted bamboos, evergreen, except after they have flowered, when they die off.

Culms very strong; shooth-sheaths quite smooth; auricles lunate, reflexed, stiff-fringed; ligule very narrow, entire; spikelets 2-2½ lin. long, clustered; caryopsis irregular globose, the size of a wood-apple; anthers yellow; stigmas white . . . . *P. compactiflorum.*

Culms very hollow and weak; shoot-sheaths minutely white-setose; auricles very small, long-fringed; ligule conspicuously (2-4 lin. long) fringed . . . . . *P. Helferi.*

1. **P. compactiflorum**, Kz.—An evergreen tufted arborescent bamboo ($15—25+0+\frac{1}{4}—\frac{1}{2}$), the stems greyish green, half-scandent, spreading and arching, with the main branchings as strong as the stem itself, the internodes 1½-2 ft. long, much thickened at the one side of the joints and somewhat zigzag; shoot-sheaths quite smooth, green or yellowish green, the imperfect blade leafy and spreading, sparingly hispid above, at the rounded base extended into a narrow, reflexed, crescent-shaped-produced and spreading stiff-fringed auricle, the ligule entire, very narrow; leaves large, oblong-lanceolate to lanceolate, obliquely truncate or obtuse at the base and narrowed into a 1-2 lin. long petiole, 6-10 in. long by 1-2 broad, subulate-acuminate, chartaceous, glabrous, rough along the one margin and towards the point, glaucescent beneath, the 9-13 nerves at each side of the midrib rather distant, faint, but rather conspicuous; sheaths appressed-silky-setose, but very soon glabrescent, at the truncate mouth produced in a lunate reflexed auricle fringed with strong, stiff, caducous hairs up to 3 lin. long, the ligule entire, narrow; spikelets very small, only about 2-2½ lin. long, broad, and in flower appearing truncate-2-cleft, 5-flowered, in dense clusters and interruptly spiked, forming, as the leaves fall, a large radical panicle; lower 2 paleas empty, the 2 following ones hermaphrodite, with a terminal rather long-pedicelled, obovate,

abortive bipaleaceous female floret carrying a lower empty outer palea at its base; outer palea of hermaphrodite florets broadly oval, ventricose, with a very short apical mucro, glossy, about 2 lin. long; inner palea as long, broadly boat-shaped, shortly 2-toothed at the apex, white-ciliate along the angles of the depressed back; lodicules 3, very large, oval, blunt, long-white-fringed; stamens 6, free, the anthers greenish yellow; ovary glabrous, in engrossing triangular-obturbinate, with a short thick truncate style; stigmas almost lateral, short, plumose, white; ripe caryopsis as large as a wood-apple, irregularly globose, glossy-green, then brown, the pericarp rigidly coriaceous; seed large, fleshy, germinating while still on the tree.

Hab.—Frequent in the drier hill forests of Martaban east of Tounghoo, at 4,000 to 6,000 ft. elevation, rarely descending to 3,000 ft.—Fl. Fr. H.S.—l.—SS.=Metam.

2. **P. Helferi,** Kz.—An evergreen tufted, bushy bamboo (20—25+0+¼), the stems very hollow, greyish green, especially while young sprinkled with appressed whitish bristles, much arched and almost scandent, the internodes about 2 ft. long, somewhat thickened and whitish at the joints; shoot-sheaths green, very fugaceously white-setulose, the imperfect blade leafy, spreading, lanceolate to linear-lanceolate, acuminate, above shortly hispid, at the narrowed base narrowly decurrent and terminating in a produced, narrow, small, long-fringed auricle, the ligule very narrow, but conspicuously fringed with white stiff hairs 2-4 lin. long; leaves large, oblong-lanceolate, usually unequal at the base and contracted in a 1-2 lin. long petiole, acuminate, ½-1 ft. long by 2-2½ and even 3 in. broad, while young rough along the borders, glabrous, chartaceous, glaucescent beneath, the 7-12 nerves at each side of the midrib rather indistinct; sheaths apparently glabrous, at the one side of the slightly produced mouth terminating in a minute, caducous, fringed auricle, the ligule fringed, but on account of the fragility of the bristles soon appearing entire or indistinctly toothed; flowers, etc., unknown.

Hab.—Frequent in the tropical and moister upper mixed forests, especially along choungs, of the Pegu Yomah and Martaban, often forming almost impenetrable jungles, up to 3,000 ft. elevation.—s : l.—SS.=Metam. SiS.

MELOCANNA, Trin.

Inflorescence spicate-panicled. Spikelets one-sided, rather depressed, compound, 5-6-flowered, bracted. Inner palea of the hermaphrodite florets convolute, the 2 or 3 lowermost outer paleas gemmiparous, and developing these buds at length into perfect spikelets. Lodicules 3. Stamens 6, free. Ovary flask-shaped,

the style long and thick, continuous with the ovary; stigmas 3, pilose. Caryopsis very large and firmly fleshy, incurved-beaked.—Arboreous or almost shrubby tufted bamboos, with very large fruits and one-sided-spiked spikelets forming panicles.

Low, 8-15-20 ft. high; leaves roughish pubescent beneath . . *M. humilis.*
Arboreous, 50-70 ft. high; leaves quite glabrous . . . . *M. bambusæoides.*

1. **M. humilis,** Kz.—An evergreen tufted bamboo (8—15 + 20 + $\frac{1}{6}$—$\frac{1}{4}$), the stems very hollow, hardly thickened at the annulate joints, the internodes about a foot long or somewhat longer; shoot-sheaths glabrous (?), very short, at the sinuate and much-produced mouth rounded and inflated, the imperfect blade linear, subulate-acuminate, erect, decurrent into a narrow, nude, green stripe bordering the sinuses, the ligule very narrow, entire; leaves lanceolate to linear-lanceolate, obtuse at the base, on a 2-3 lin. long petiole, subulate-acuminate, 4-6 in. long by $\frac{2}{3}$-1 broad, very rough along the one margin, glaucescent and minutely roughish pubescent beneath, the 8-10 nerves at each side of the midrib very faint; sheaths glabrous, long-fringed at the minutely auricled mouth; flowers, etc., unknown.

Hab.—Common in the upper mixed forests of Arracan; also in Pegu, in the Pazwoondoung valley near the village Wanet.—s.—SS.=SiS.

2. **M. bambusæoides,** Trin.—An evergreen arboreous tufted bamboo (50--70 + (?) + $\frac{1}{3}$—1), the stems far up void of branches, very hollow, green, not thickened at the joints; shoot-sheaths reddish or yellowish green, very brittle, minutely appressed white-bristly, much produced and rounded-falcate at the widened sinuate mouth, the imperfect blade erect, linear-lanceolate, long-acuminate, at the base decurrent into a narrow, green, nude stripe extending over the whole sinus at both sides, the ligule very narrow, minutely ciliate; leaves lanceolate to linear-lanceolate, somewhat truncate at the base, on a 2-3 lin. long petiole, 1-1$\frac{1}{2}$ ft. long by 1-1$\frac{1}{2}$ in. broad, subulate-acuminate, chartaceous, glabrous, along one margin more rough than along the other, glaucescent beneath, the 7-14 nerves at each side of the midrib inconspicuous and faint; sheaths glabrous, long- and stiff-fringed at the minutely auricled mouth; spikelets compound, sheathed, rather depressed, 5-6-flowered, $\frac{1}{2}$ in. long, collected into dense, one-sided, short spikes forming an ample, after the fall of the leaves radical, panicle; florets distichous, the lower 2 or 3 outer paleas gemmiparous, and the buds at length developing into perfect spikelets, the next palea empty, the following hermaphrodite and accompanied by a pedicel-like rudimentary floret; outer palea of hermaphrodite florets very concave and embracing the base of the short rachillæ, subulate-acuminate, glabrous; the inner palea convolute, mucronate-acumi-

nate; lodicules 3, transparent, almost falcate-lanceolate, minutely ciliate towards the apex; anthers yellowish, notched at both ends; ovary flask-shaped, glabrous, continuous with the long, thick, 3-cornered persistent style; stigmas 3, pilose, white; caryopsis ovate, the size of a small pear, firmly fleshy, smooth, green, incurved-beaked.

Hab.—Chittagong hills; Tenasserim.

DINOCHLOA, Buse.

Inflorescence almost racemulose- or clustered-panicled. Spikelets rather terete, ovate, 3-flowered, the lower 2 flowers reduced to the outer paleas, the terminal one hermaphrodite. Inner palea much longer than the outer, concave. Stamens 6, free. Lodicules none. Ovary with a firm pericarp, ovate, narrowed in a short strong style; stigmas 3, short, villous. Caryopsis ovoid, acuminate, dry.—Lofty climbing bamboos, with usually zigzag-curved stems, dying off after fruiting. Spikelets minute.

Spikelets in a dried state straw-coloured, hardly a line long; shoot-sheaths fugaceously white-setulose, not auricled and narrowed towards the mouth . . . . . *D. Andamanica.*
Shoot-sheaths fugaceously silvery, not narrowed upwards, at the mouth thickened and polished green . . . . . *D. Maclellandii.*

1. **D. Andamanica**, Kz.—An evergreen, lofty, scandent bamboo, ascending up to 100 ft. and depending from the highest trees, the stems zigzag-geniculate, about an inch thick, green and glossy; shoot-sheaths green or purplish green, sprinkled with white, minute, very fugaceous bristles and usually white-powdery towards the base, rounded and often somewhat waved at the mouth, not auricled, but furnished with a poor fringe of stiff fragile hairs, smooth along the margins, the imperfect blade leafy, ovate-lanceolate to lanceolate, acuminate, erect-spreading, above minutely hispid, the ligule connecting the 2 rounded apices of the mouth and minutely toothed; leaves large, oblong-lanceolate to lanceolate, at the rounded base contracted in a very short petiole, setaceous-acuminate, 6-12 in. long by 1-2 broad, smooth on both sides, hardly rough along the one margin, thin-chartaceous, the 7-9 nerves at each side of the midrib faint, but distinct; sheaths glabrous, almost rounded at the somewhat produced mouth and here fringed with long hairs; the ligule narrow, whitish, extending along the whole mouth, entire; spikelets minute, $\frac{1}{2}$-1 lin. long, ovate, glossy, straw-coloured, glabrous, sessile, clustered and interruptly spiked, collected in a raceme-like, narrow, terminal panicle; lower palea saccate-cymbiform, shortened, retuse-mucronate, empty; outer palea of hermaphrodite florets broadly convolute-ovate, acute, smooth, nearly a line long,

the inner one conform; anthers spuriously 4-celled, acuminate; ovary, etc., unknown.

HAB.—Common in the tropical forests of the Andamans.—Fl. March.—s: l.—SS.=Metam. SiS., etc.

2. **D. Maclellandii** (*Bambusa Maclellandii*, Munro).—*Wanway.*—An evergreen, lofty, scandent bamboo ascending trees of 60-100 ft. height or spreading over lower ones, the stems up to an inch thick, geniculate at the thickened joints, rather hollow, greyish green, while young fugaceously silvery from appressed minute bristles; shoot-sheaths fugaceously silvery from appressed minute bristles, green or yellowish green, rounded at the mouth and bordered by a thickened, polished, green margin extending to the base of the leafy, spreading, ovate-lanceolate, acuminate, imperfect blade, the ligule short, entire; leaves large, oblong-to ovate-lanceolate, at the rounded base contracted into a 1-2 lin. long petiole, subulate-acuminate, $\frac{1}{2}$-$1\frac{1}{4}$ ft. long by $1\frac{1}{4}$-$3\frac{1}{2}$ in. broad, smooth, retrorsely rough along the one margin, especially towards the point, chartaceous, the 10-17 nerves at each side of the midrib more or less distinct; sheaths while young very fugaceously appressed-silvery-setulose, soon quite glabrous, slightly produced at the mouth, and furnished with an appressed rounded glossy nude auricle, the ligule extending all along, and somewhat exceeding, the mouth, entire; flowers, etc., unknown.

HAB.—Frequent in the tropical forests of the eastern slopes of the Pegu Yomah and Martaban; also Chittagong.—SS.=SiS. Metam.

B. CRYPTOGAMIC PLANTS.

FILICES.

Spores in minute capsules (called *spore-cases*), stalked, collected in clusters as batches (the so-called *sori*) on the under-surface or on the margin of the leaf-like expanded branches (fronds), which are either conform with the barren ones or more contracted, sometimes resembling simple or branched spikes; the sori either naked or furnished with an involucre (*indusium*) either cup-shaped or covering the sorus when young, and opening on the side or at the top, or in 2 valves.—Main trunk usually perennial, either erect and woody, or more frequently reduced to a short stock, or to a creeping rhizome very rarely annual. Fronds radical or alternate, when young usually rolled inwards at the top, simple or variously lobed or

compound, the stalk (called *stipes*) and the rachis and more especially the rhizome frequently bearing glossy scales.

Sori hemispherical, on a vein, or in the axil of a forking of a vein. Receptacle elevated; involucre globose, inferior, complete, afterwards bursting and forming a more or less persistent cup; arboreous ferns with often decompound leaves . . . *Cyathea.*
As former, but without an involucre; fronds decompound . . *Alsophila.*
Sori continuous along the transverse veins near the midrib and also along the veins towards the margin of the frond; involucre none; low simple-stemmed tree ferns with simply pinnate fronds . . . . . *Brainea.*

CYATHEA, Sm.

Sori globular, situated upon a vein or veinlet, or in the axil of a fork of the vein. Receptacle elevated, globular or columnar; involucre globular, inferior, membranous or somewhat horny, at first entire and covering the whole sorus, at length bursting from the top with a circular opening, becoming cup-shaped, more or less entire or jagged or lobed. Veins pinnate, simple or forked, free.—Trees, or rarely stemless, the trunk usually covered with the persistent bases of the stipes or with the conspicuous scars of the fallen ones. Fronds pinnate or decompoundly pinnate, rarely simple. Stipes often horny armed.

1. **C. spinulosa,** Wall.—An evergreen small fern-tree; fronds bipinnate, ample, 4-6 ft. long, the stipes and rachises tubercled-prickly, the secondary rachis above and also the young main rachis brown-villous; pinnæ 1-2 ft. long, the uppermost ones confluent and serrate, acuminate; pinnules 1½-3 in. long by ⅓ broad or somewhat broader, sessile, firmly membranous, deeply (almost to the base) pinnatifid, serrulate-acuminate, the midrib above tawny-pubescent, the segments falcate-oblong, acute, crenulate at the upper part, glabrous or usually sprinkled with small bullate scales beneath; veins forked and simple; sori numerous, large, in 2 dense rows covering the whole breadth of the segments and possessing a rather shaggy appearance from the burst, membranous, pale-coloured, globular involucres.

Hab.—Upper Tenasserim, Ta-oo table-land.—Fr. Apr.

ALSOPHILA, R. Br.

Sori globose, situated upon a vein or in the axil of a fork. Receptacle elevated, frequently villous. Involucre none or almost one. Veins pinnate, simple or forked, free.—Trees, or rarely stemless, the trunk usually marked by the conspicuous scars of the

fallen fronds or the persistent bases of their stipes. Fronds pinnate or decompoundly pinnate.

* *Pinnules glaucous beneath, the segments entire.*

Stipes and rachises (in Burmese plant) quite smooth, pruinous . *A. contaminans.*

* * *Pinnules uniformly green; segments crenulate (at least at the apex).*

Sori placed in 2 diverging rows forming the letter V; stipes and rachises glossy dark-brown, smooth; pinnules petioled . . *A. glabra.*

Sori placed in 2 parallel dense rows; stipes and lower part of rachis prickly tubercled, the secondary rachises above densely villous; pinnules sessile . . . . . *A. latebrosa.*

1. **A. contaminans,** Wall.—An evergreen fern-tree (8—15 + 3—6 + 1—1½), the young fronds tawny-tomentose and covered with glossy tawny scales; fronds bipinnate, 4-7 ft. long, the stipes and rachis pruinous, smooth, or more or less prickly; primary pinnæ 2 ft. long or longer, acuminate; pinnules sessile, 3-6 in. long, linear-oblong, deeply and almost to the rib pinnatifid, caudate-acuminate, glaucous or almost whitish beneath, the segments almost falcate-oblong, blunt, entire or nearly so, ⅓-½ in. long by 2-3 lin. broad (the fruiting ones narrower), the veinlets simple or forked; sori nearer to the rib than to the margin; emptied receptacles surrounded by a minute slightly lobed and cut membrane.

Var. 1, **contaminans proper:** stipes and rachis prickly.

Var. 2, **inermis:** stipes and rachis quite unarmed, pruinous.

Hab.—Only var. 2: very rare in the tropical forests of the eastern slopes of the Pegu Yomah, more frequent in those of Martaban and Tenasserim.—s.—SS.—SiS. *Metam.*

2. **A. glabra,** Hook.—An evergreen fern-tree (10—20 + 4—12 + 1), the frond-shoots tawny-puberous and covered with fuscous glossy scales; fronds bipinnate, 3-5 ft. long, ample, the stipes and rachis glossy dark brown or blackish brown, smooth; primary pinnæ 1-3 ft. long, the upper ones confluent and long-serrate-acuminate; pinnules membranous, from a truncate base elongate-oblong, serrate-acuminate, 3-6 in. long by ½-¾ broad (the fertile ones somewhat smaller), deeply (up to ¼ or ½) pinnatifid, the lobes unequally rounded to almost truncate, short, the apices serrulate; veins pinnate, the veinlets all simple; sori in V-shaped rows, rather copious, but not extending to the apex of the pinnule.

Hab.—Frequent, especially along choungs, in the tropical forests from Martaban down to Tenasserim; also Chittagong.—Fr. C.S. & H.S.—s.—SS.—Metam.

3. **A. latebrosa,** Hook.—An evergreen fern-tree (20—30 + 15—25 + 2—3), the trunk black and rough from the scars and remnants of the stipeses, the frond-shoots rusty-tomentose; fronds bipinnate, 4- ft. long, the stipes and lower part of the rachis prickly tubercled, th secondary rachises all rusty-villous on the upper side and glabrou

and sparingly minutely puberous beneath; pinnæ 2-3 ft. long, the uppermost ones confluent and serrate-acuminate; pinnules membranous, sessile, linear-lanceolate, 2-3 in. long by $\frac{1}{3}$ broad or broader, deeply (to $\frac{3}{4}$) pinnatifid, serrate-acuminate, the segments curved-oblong, obliquely rounded or acute at the apex, crenulate; sori alternate near the base of the veins and forming 2 close linear rows usually not longer than $\frac{1}{2}$-$\frac{1}{3}$ of the pinnule; veins forked or occasionally simple.

Hab.—Not unfrequent in the damp hill and in the tropical forests of Martaban, at 2,000 to 6,000 ft. elevation.—Fr. March.—s.—SS.=Metam.

BRAINEA, Hook.

Sori linear, simple or branched, continuous along the transverse veins near the midrib and also produced along the veins in the direction of the edge of the frond. Veins united so as to form one series of large oblong costal areoles, the rest free, simple or forked.—Low Cycas-like fern-trees, with simply pinnate leaves springing from the summit of the trunk.

1. **B. insignis,** Hook.—An evergreen fern-tree (3—5 + 2—4 + $\frac{1}{2}$—1$\frac{1}{2}$), with a simple or branched trunk densely covered with black stiff root-like fibres; fronds 3-4 ft. long, pinnate, the stipes at the base covered with long, stiff, brown scales; pinnæ numerous, alternating or nearly so, more or less obliquely truncate-rounded at the base, coriaceous, linear, 3-5 in. long, serrulate, long-serrulate-acuminate, especially in the fruiting fronds the veins above strongly impressed; sori crowded and often covering the whole under-surface of the pinnæ, leaving only the margins naked.

Hab.—Frequent in the pine and drier forests of the Martaban hills east of Younghoo, at 4,000 to 6,000 ft. elevation.—Fr. March.—s.—SS.=Metam.

ADDITIONS AND CORRECTIONS.

P. 1, line 4 from below, *add* "L." *after* **VIBURNUM.**

P. 83, after **Pluchea Indica,** *add:*

2. **P. eupatorioides,** Kz.—An undershrub, all softer parts shortly viscid-pubescent; leaves linear, acuminate at both ends and tapering into a short petiole, coarsely serrate-toothed, 2-3 in. long, membranous, viscid-puberulous, especially beneath; flower-heads about 2½ lin. long, shortly and slenderly peduncled, forming glandular-puberulous, shortly peduncled corymbs in the axils of the upper-most leaves and collected into a terminal larger one; involucre-bracts scarious, ovate-lanceolate, bluntish to acute, appressed-puberulous, the innermost ones thinner and linear, acuminate, nearly 2 lin. long; achenes minute, 5-ribbed, glabrous, the papus white, 2-2½ lin. long.

HAB.—Adjoining Siamese provinces.—Fl. Fr. H. S.

P. 98, line 15 from below, *read* **M. Andamanica,** Kz., *for* **M. verrucosa,** Scheff.

P. 107, line 18 from above, after "brownish" *add* "or rusty tomentose."

P. 114, before **AEGICERAS** *insert:*

21. **Ardisia virens,** Kz.—A small shrub, very much resembling *Amblyanthus glandulosus* in foliage and inflorescence, all parts glabrous, the branches slender, somewhat compressed and twisted; leaves oblong-lanceolate to oblong, acuminate at both ends, shortly petioled, thick-membranous, slightly repand and gland-like thickened in the sinuses, 3-5 in. long, green, glabrous and not dotted, the lateral nerves numerous, thin and rather parallel, the veination thin and lax; flowers middling-sized, but showy, white, on glabrous spreading pedicels 1-1½ in. long, forming a recurved, simple, or very rarely laterally branching glabrous almost sessile corymb at the end of the branchlets; calyx-lobes herbaceous, oval, blunt, speckled, about a line long; corolla-lobes ovate, acuminate, about 3 lin. long; berries globose, the size of a large pea, pale-coloured, purplish-speckled, glabrous, somewhat fleshy.

HAB.—Ava hills.—Fr. close of R.S.

P. 117, before **ACHRAS,** L., *insert:*

SARCOSPERMA, Hf.

Calyx-segments 5, almost equal, much imbricated. Corolla broadly bell-shaped, the tube very short, the limb 5-lobed, imbricate in bud. Stamens 5, attached to the tube of the corolla; filaments very short. Staminodes 5, minute, subulate, inserted below the sinuses of the corolla-lobes. Ovary 2- or by abortion 1-celled, with ascending ovules; style subulate, with a shortly 2-lobed stigma. Drupe olive-shaped, firmly fleshy or almost coriaceous, 1- or 2-seeded. Albumen none. Embryo almost conform with the seed, fleshy, the cotyledons consolidated and homogeneous, the radicle hardly prominent.—Trees, with opposite or alternate leaves. Stipules narrow, very deciduous. Flowers small, panicled or in fascicles arising from axillary branchlets. Bracts minute.

1. **S. arboreum**, H.f.—A small evergreen tree, the young shoots fugaceously tawny-puberulous; leaves oblong-lanceolate to oblong, acute or obtuse at the base, on a brownish powdery petiole up to ½ in. long, bluntish apiculate, thin-coriaceous, glabrous, and somewhat silky-glossy, perforated-glandular in the nerve-axils beneath; flowers small, whitish, almost sessile, clustered, forming rusty-puberulous panicles in the axils of the leaves and much shorter than them; calyx tawny-puberulous, the lobes oval, about a line long; drupes ovoid-oblong, about an inch long, bluish black, pruinous.

HAB.—Ava hills.

P. 124, **Mimusops parvifolia**, Kz. (not of R. Br.) had better be omitted. It is based upon doubtful material, and is more likely a new species of **Sideroxylon.**

P. 134, line 4 from above, *read* "8-celled" *for* "4-celled (?)."

P. 155, line 9 from above, *read* "L." *for* "Juss."

P. 182, line 2 from below, *omit* the words "or glabrous." The two species of **ALSTONIA** here adopted are more likely only varieties.

P. 192, line 8 from below, *omit* the synonym and the citations between brackets.

P. 249. The genus **GELSEMIUM** should be taken out here and placed in *GENTIANEÆ* (p. 203).

P. 259, line 7 from below, after "branchlets" *insert* "corolla-limb clothed with long, blue, soft hairs, especially towards the throat."

P. 301, line 16 from above, *read* "*T. calophylla*" *for* "*J. calophylla.*"

P. 312, line 9 from below, *read* "4 in. long" *for* "1 in. long."

P. 464, line 12 from below, *read* "simple" *for* "single."

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ORDERS, GENERA, AND SPECIES.

[*Synonyms are printed in italics.*]

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ಡಾ॥ ಎಂ.ಹೆಚ್.ಮರೀಗೌಡ ರಾಷ್ಟ್ರೀಯ ಗ್ರಂಥಾಲಯ
ಲಾಲ್‌ಬಾಗ್, ಬೆಂಗಳೂರು – 560 004

ಪ.ಸಂಖ್ಯೆ.....

ವ.ಸಂಖ್ಯೆ:.....

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ಈ ಕೆಳಗೆ ಕಾಣಿಸಿರುವ ದಿನದಂದು ಅಥವಾ ಅದಕ್ಕೂ ಮುಂಚೆ ಈ ಪುಸ್ತಕವನ
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ಪು.ತಿ.ನಿ

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